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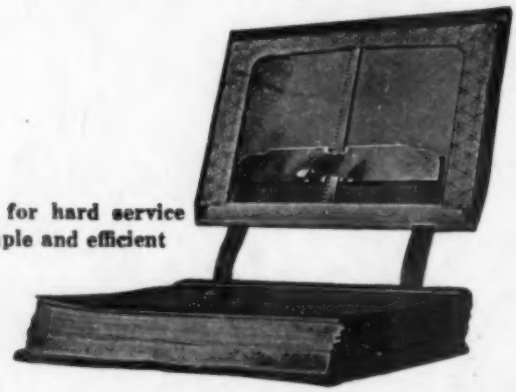

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The Chief of Infantry with the Infantry Rifle Team Squad, 1929

INFANTRY JOURNAL

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Mechanization in Europe[1]

MAJ. C. C. BENSON, Cavalry

GREAT BRITAIN

THE British expect mechanization to overcome the dominant power of the defensive and to restore decisive maneuver in battle. Their present director of mechanization, Maj. Gen. S. C. Peck, C. B., D. S. O., sums up the situation thus: "* * * we are in a purely experimental stage—feeling our way; but personally I am convinced that mechanization has come to stay. It is the pivot around which future armies must organize * * *." The fighting machines that first appeared in action on the Somme thirteen years ago have risen to high estate. In Great Britain, at least, their technical improvement has kept pace with the rapid progress of automotive industries; and their tactical employment has become a matter of prime importance. Mechanization experiments, inconclusive as yet, have already worked a miracle—they have shifted the focus of military thought from the past to the future. Old methods are giving way to new; but in the present transitional period, no one can say definitely what effect the motor will have on the battlefield of tomorrow.

WORLD WAR PERIOD

British enthusiasm for fighting machines began with the men who saw the first tanks in action. A soldier's letter, written in September, 1916, and widely circulated in England at the time, gives a vivid impression of the amazement and delight with which those early tanks were received. "They can chew up barbed wire and turn it into munitions. As they run they slash their tails and clear away trees, houses, howitzers, and anything else in the vicinity. They turn over on their backs and catch live shells in their caterpillar feet, and they can easily be adapted as submarines; in fact, most of them crossed the channel in this guise. They loop the loop; travel forwards, sideways and backwards, not only with equal speed, but at the same time. They spin around like a top, only far more quickly; dig themselves in, bury themselves, scoop out a tunnel, and come out again ten miles away in half an hour." Slow, unwieldy, and mechanically unreliable though they were, some of these early machines crashed their way through strong German defenses; they terrified the German front line troops, and renewed British hopes for release from the hell of trench warfare. German leaders heaped scorn on their first clumsy efforts; but had they realized the moral effect of these machines, they

[1] By special arrangement between the author and the editors, this article appears in publications other than the INFANTRY JOURNAL.

might have come closer to estimating the true value of the new weapon.

The tanks, having successfully passed their initial battle test, were rapidly improved. Sir Albert G. Stern in England and General Estienne in France independently fostered the tank idea, and it was largely through their individual efforts that the "chariots of assault" developed into effective weapons. It required, however, the smashing attack of nearly five hundred heavy tanks at Cambrai to convince the Allied leaders that this new weapon could overcome the power of the defensive. From then to the end of the war, the Allies employed tanks in increasing numbers; and had the war continued, 1919 would have witnessed great battles with tanks in the leading rôle. When the Armistice was signed, work was in progress on three thousand five hundred French light tanks, five thousand British heavies, one thousand five hundred British-American extra heavies, and twenty-one thousand eight hundred and ninety tanks of various types for the American Army. *A total of over thirty thousand tanks would have been ready for action in the Allied armies in the spring of 1919.* Germany was making strenuous though belated efforts to supply her forces with tanks. Few military men knew the extent of the tank program that was under way when the war ended; and right now there are even fewer who would know how to use thirty thousand tanks. Even when employed in limited numbers, tanks had established the fighting machine as a powerful offensive weapon. They helped to restore movement to a situation that had become rigidly stabilized; reduced materially the casualties of attacking infantry; lowered German morale and raised that of the Allies; and pointed the way to one sure line of future development.

PRESENT CONDITIONS IN GREAT BRITAIN

These costly lessons from combat experience have stuck by the British army. It ended the World War with the best tanks then in existence, and definite ideas on how to use them. Since the war, Great Britain has spent large sums to develop better fighting machines and improved tactical methods. Her responsible civil and military leaders are definitely committed to the policy of extensive mechanization for Regular Army units; she has the necessary scientific and industrial resources to equip, man, and maintain large mechanized forces. Their are naturally differences of opinion on when and how to apply this policy, and the usual dearth of peace-time funds for the necessary changes. Measures already taken have undoubtedly placed the British in the forefront of mechanization progress, and there they propose to stay.

Before going into the details of this subject, let us consider some of the factors that affect British mechanization plans. Industrially, the World War was disastrous to Great Britain. Her complicated industrial machinery was thrown badly out of alignment for commercial purposes; the progressive substitution of oil for coal, and extensive boycotts in India and China on British manufactured goods made matters worse. Furthermore, British manufacturers have had to meet stiff competition from European and American producers. For ten years, unemployment has been, as it still is, the most vital domestic problem of the government. Within the past year,

conditions have taken a turn for the better; and though there are still over a million workers unemployed, business is picking up. Despite hard times, the British found money for army mechanization experiments, and improved industrial conditions will probably bring more liberal appropriations.

The peculiar situation of the British army hinders any radical change in organization. The Cardwell system binds home organizations to similar units in India; and so long as this system remains in effect, the organization, equipment, and training of the correlated units must be such as to make them interchangeable. In India, the most likely scene of conflict is on the northwestern frontier, in a mountainous region entirely unsuited to machine warfare; consequently, the Indian army authorities are loath to accept the full measure of mechanization that is desired for home units. These home units may at any time be united into an expeditionary force for service in a theater of operations where conditions differ materially from those in India. Clashes between Moslems and Jews in Palestine may require Great Britain to send an expedition to preserve order there. Detachments of aircraft, armored cars, and motorized foot troops have already been dispatched to the danger zone. British commitments under the Locarno Pacts indicate Europe as another possible theater of war. There the terrain is generally suitable for mechanized warfare; moreover, a British expeditionary force could rely upon the cooperation of allied troops organized on traditional lines. Under these circumstances, the expeditionary force might well be completely mechanized. The British improvised a tank corps during the World War, and an excellent job they made of it; but no such deliberate measures will do for an expeditionary force. It must be ready to go quickly when the need arises. Hence the protagonists of mechanization urge the immediate organization of strong mechanized units. The British War Office, prodded by enthusiasts at home and repressed by conservatives in India, is in a quandary. Its efforts to reconcile divergent but interdependent interests will take time, and until a satisfactory settlement is reached, British plans for extensive mechanization will be handicapped.

RECENT EXPERIMENTS

In the meantime, experiments in mechanization are under way in England. Fortunately for the progress of these experiments, the British tank corps has enjoyed a continuous existence ever since its creation as a new combat branch during the World War. It has preserved the high ideals of service that characterized the tank corps pioneers, and has given continuous study to the organization, equipment, training, and tactical employment of mechanized units. Tank corps units are not normally included in corps or divisions; they are considered as part of the G. H. Q. reserve. The tank corps at present includes only four tank battalions and eleven armored car companies; but these units are well equipped and have had a great variety of practical experience in England, Egypt, India, and China, in the mechanical and tactical operation of their vehicles. They are well qualified to set the standard for whatever mechanized forces are organized.

The first of these forces, a mechanized brigade, was formed in 1926 to

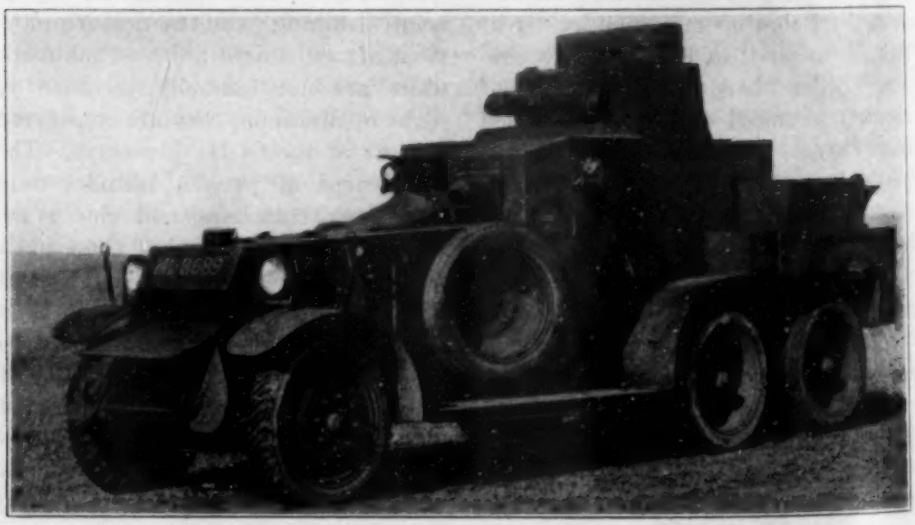
study the organization and tactics of a unit equipped with armored fighting machines. During 1927 and 1928, this force participated in maneuvers with infantry divisions and cavalry brigades. Having learned what it could from the operations of this force, with the equipment available, the War Office disbanded it. The 1929 program involves a number of experiments with the details of organization and equipment of several small units, but is principally concerned with a combination of motorization and mechanization as applied to two infantry and two cavalry brigades. Tests of various machines, including self-propelled gun mounts, already begun with two field artillery brigades, are to continue. This apparently radical change in the development of mechanization projects indicates expediency rather than policy. The armored force was discontinued in order to make its component units and vehicles available for important work in other closely related fields. As in our own service, the real problem of mechanization is to work fighting machines into the tactical thought and practice of the army. When the older branches accept partial mechanization for their own purposes, they will better appreciate the need for separate fast-moving mechanized forces, and will understand how to cooperate with those forces. By enabling the older branches to educate themselves, British mechanization experiments of this year will have a far-reaching influence upon the army as a whole.

INTERESTS OF VARIOUS BRANCHES

So much has been written about the British mechanized maneuvers, by observers and participants, that it is hardly worth while to recount the details here. However, some items that apply to particular branches are of special interest.

Cavalry:

For close reconnaissance, the British consider the horse soldier indispensable and irreplaceable. Nevertheless, two cavalry regiments have had their horses replaced by armored cars. All of the home cavalry regiments have been sup-



Lanchester Armored Car

plied with light six-wheeled trucks for their first line transport. Each of the two cavalry brigades employed in the 1929 mechanization experiments has Carden-Loyd machine gun carriers in place of the light six-wheelers previously used; some "Baby" Austin scout cars for use on reconnaissance; and a mechanized 3.7-inch howitzer battery. On the march, the howitzer carriage is mounted on a caterpillar trailer which is towed by a Carden-Loyd. This rig appears to be awkward, but it is reported to work well enough for experimental purposes. These cavalry brigades are assigned duties, particularly in difficult country, for which completely mechanized units are unsuitable.

The present British armored cars have limited ability to surmount obstacles encountered on the road, or to maneuver across country except on the most favorable terrain. The Rolls Royce car weighs eight thousand three hundred pounds; and the new Lanchester, with much heavier armor than heretofore, thirteen thousand five hundred pounds. Several different models of the wheel and track type have been tried without much success, but experimental work along this promising line continues. The service machines carry less armor and fewer weapons than tanks; they are, however, silent, fast, and reliable mechanically. Their great radius of action makes them particularly suitable for long distance reconnaissance. Where the terrain permits, armored cars are used on many of the security and reconnaissance missions that were formerly assigned to cavalry detachments.

Engineers:

Remarkable progress has been made in the development and use of bridging equipment, including pontoons, for mechanized forces. The pontoons are light, collapsible, and can be conveniently nested. The roadway of the pontoon bridge is made with duckboards that can be placed in position quickly. It is proposed to carry the pontoons and some of the heavier materials on specially constructed trailers. The engineer units of the mechanized formations are provided with six-wheeled trucks, and have power-driven tools to supplement their normal equipment.

Chemical Warfare:

All mechanized force troops have been equipped with training gas masks. Exhaustive tests have demonstrated that tanks can be operated successfully under all expected field conditions by men wearing gas masks. The superintendent of the British Chemical Warfare Research Department states, "We satisfied ourselves that it would be impossible to get in the field a sufficient concentration to appreciably affect the engine." To make tanks gas tight, and to provide adequate ventilation at the same time, is considered impracticable at present. The tank development most recently, Vickers sixteen-ton model 1928, has no special provision for protection against gas.

Experiments have been conducted with Carden-Loyd machines as carriers for smoke-producing devices; but though the smoke produced was satisfactory, this line of development has received no encouragement from the tank corps. An armored vehicle with a weapon that can fire smoke shells, either when in motion or stationary, is considered more useful than the smoke producing machine.

Signal Corps:

Radio telephone and telegraph have been developed for armored fighting machines, and have been in successful

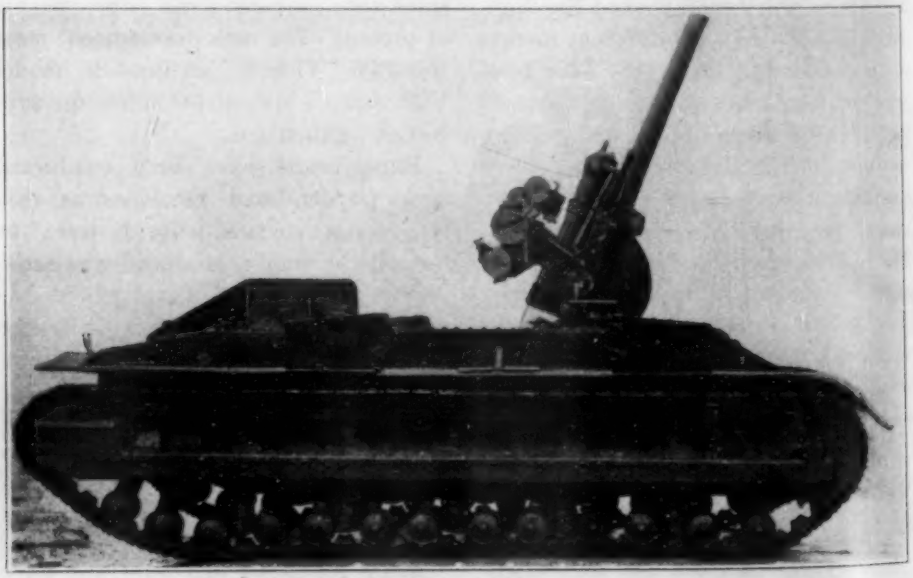
use since 1926. Short orders, suitable for drill and maneuver purposes, are sent readily by radio telephone. Changes of formation, direction, and speed of the fighting machines can thus be directed and controlled in a way that permits full utilization of their mobility. The use of signal flags within platoons has been tried and found wanting; at high speeds visibility is none too good at best and when fog, smoke, or dust interfere, the signal flags are useless. Two standard radio telephone sets are in use: one, powered by a gasoline motor, has a range of over fifty miles; the other, for which accumulators provide the power, has a range of five miles. Both can be used for wireless telegraphy with greatly increased ranges. Even with these facilities, which are probably better than those of any other army, the British are still confronted with many unsolved problems connected with the control of mechanized units.

Successful tests have been made with a Vickers gyroscopic direction indicator. It is said to be a non-magnetic, compressed air operated device, which is far more reliable than a compass for the navigation of a tank.

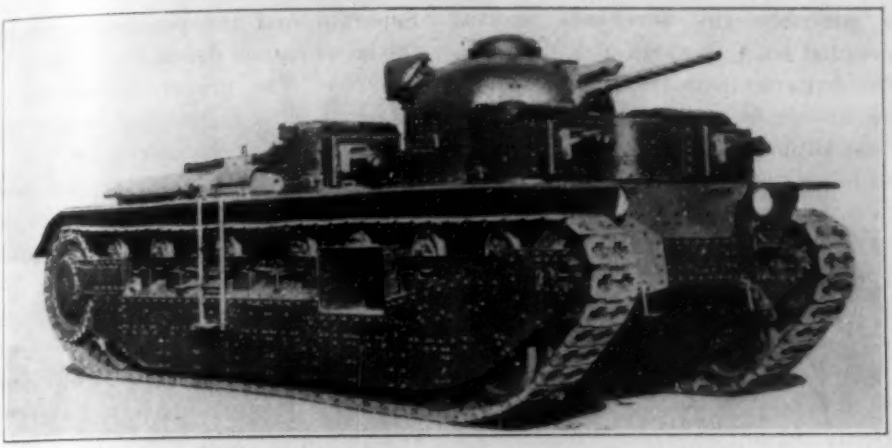
Artillery:

Must we still figure in terms of six-horse teams when powerful motors are available? Why the three-inch gun for divisional artillery? If the motor can be used, why hitch it to a comparatively light weapon? To what extent can motors increase the power and mobility of artillery? These are a few of the questions that British experiments have aroused.

Extensive tests have been made with wheeled and half-track tractors, trailers, armored caterpillar tractors ("dragons"), and self-propelled mounts. All mobile antiaircraft artillery is now motorized, the guns being mounted on trailers which are towed by six-wheeled tractors. Antiaircraft equipment for the 1929 experiments includes machine guns and antiaircraft guns mounted on special cross-country



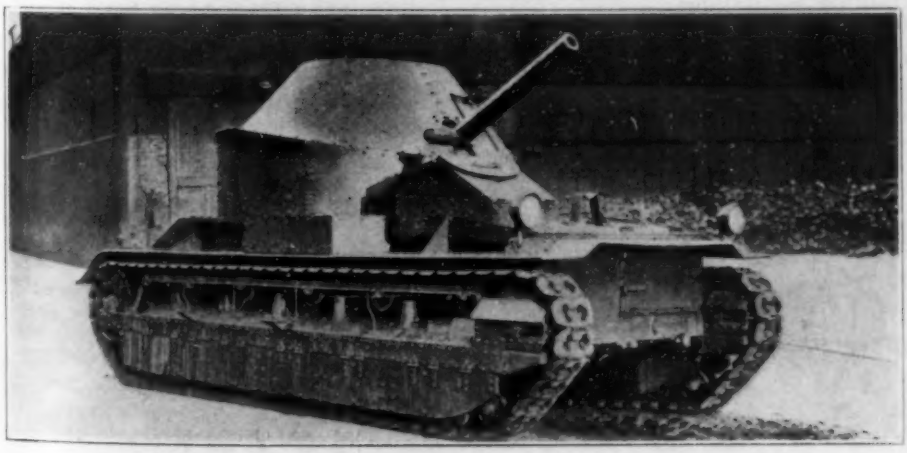
18-Pounder on Self-propelled Mount; Early Type



Heavy Tank

carriers. The carriers provide armored protection for the engine, the driver, and for the members of the gun crew except when operating their weapons. Two 3.7-inch howitzer batteries, for the close support of cavalry, have been experimentally provided with caterpillar trailers of the Carden-Loyd Mark VI machines. Three brigades of field guns have been motorized with Burford and Crossley half-track (Kegresse) tractors, and "dragons." The dragons are apparently in excellent standing at present, presumably, because they do the work and fit neatly into the mechanized force. Weight, about nine tons; speed, sixteen miles an hour; capacity, eleven men, one hundred and twenty-eight rounds of field gun ammunition, and a 3.3-inch gun in tow; engine, air-cooled, the same as used in the medium tank. The latest model dragon has proven satisfactory as a tractor for medium artillery, and has definitely been adopted for that purpose.

Experiments with self-propelled mounts for various artillery weapons have been continuous since the World War. The most recent development



18-Pounder on Self-propelled Mount, Latest Type

is probably the three-inch mortar mounted on a Carden-Loyd Mark VI. Two batteries with these experimental mounts are being tested for use in the close support of infantry. Self-propelled mounts for field guns have had their troubles. The first type produced carried a gun that could be used either as a field piece or an antiaircraft gun: weight, twelve tons; speed, fifteen miles an hour; capacity, one 18-pounder gun, six men, and one thousand seven hundred and fifty pounds of ammunition; engine, air-cooled, the same as used in the medium tank. A second model gave the crew some protection. The latest model has abandoned the dual purpose idea; it provides simply an armored field gun on a tank chassis, and is, in fact, nothing more nor less than a tank.

Some batteries are now equipped with radio telephones. To provide transportation for battery headquarters and instruments, a car with a specially designed body is to replace the touring car formerly used.

Infantry:

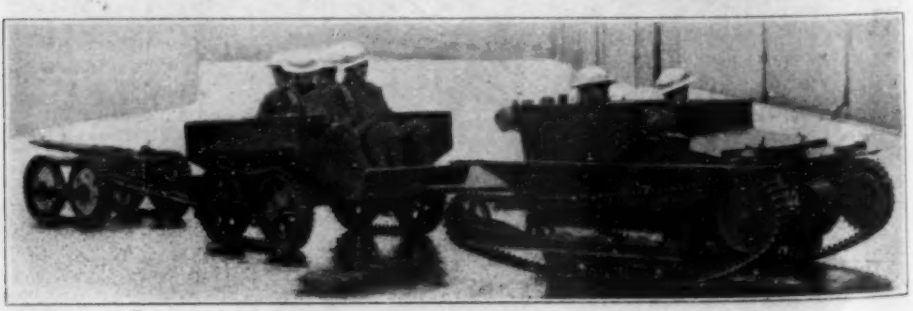
The following significant change appeared in the 1926 revision of the 1924 training regulations:

1924—"Infantry in the end wins battles. To enable it to do so, the cooperation of other arms is essential. Separate and independent action by the latter cannot defeat the enemy."

1926—"The proper cooperation of all arms wins battles and enables the infantry to confirm the victory."

What this change connotes is a question that British captains are called upon to discuss as part of their promotion examinations.

The infantry was represented in the armored force of 1926-27-28 by one battalion—three machine gun companies of twelve guns each, and one rifle company. Six wheelers and half-track trucks were used for transportation. The 1929 experiments involve the partial motorization of two infantry brigades—the 6th at Aldershot and the 7th at Tidworth. The infantry battalions of these experimental brigades are not motorized. These tests include the use of Carden-Loyd armored tractors and caterpillar trailers for the transportation of men, ammunition, and weapons. The tractor is comparatively slow, but inconspicuous, light, simple and cheap. It provides partial armored protection for driver and gunner, and carries either a .303 machine gun with three thousand five hundred rounds of ammunition, or a three-inch mortar which has a range of two thousand yards. The machine gun can be fired from the machine, but normally, as with the mortar, it is dis-



Antitank Gun, Tractor and Detachment

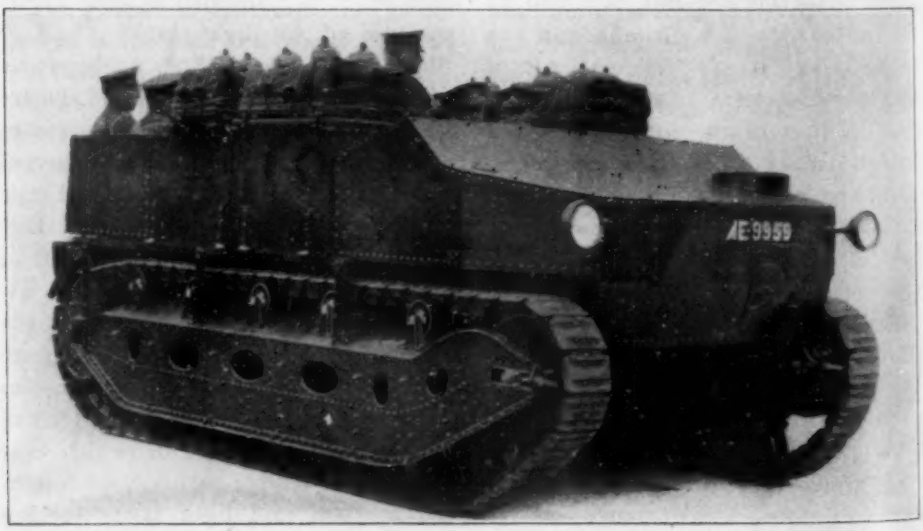
Carden-Loyd, with Mortar

mounted for firing. When traveling at six miles an hour, the carrier is so rough riding that it would be difficult for a machine gunner to hit a haystack a hundred yards away. The trailer can run on either wheels or caterpillar tracks; accommodates four men or extra ammunition as desired; and when equipped with tracks, has good cross-country ability. The .8″ antitank gun, on its own trailer mount, is towed by the tractor; the .5″ antitank gun can be mounted on the tractor. All of these weapons are intended for the close support of the infantry. Their tactical uses, as well as the best methods of transportation, are being worked out. In addition, the attachment of a light tank battalion to each of the experimental infantry brigades will help to decide whether tanks should be an organic part of the infantry brigade. The idea that fighting machines must actually accompany associated troops has lost ground, but infantry commanders are not yet ready to concede this point. Tactical ideas change slowly, but it seems futile to tie fast, bullet-proof, modern tanks to slow-moving unprotected infantry. Results of this year's test should throw some light on this question.

The following items from the *Army, Navy, and Air Force Gazette* give an idea of the operations in which these brigades have taken part. Referring to a rear guard action of July 26-27, the *Gazette* says: "The Southern commander * * * decided to make vigorous use of his light tanks. * * * Shortly after dawn * * * the whole of the Southern light tanks and the 1st Battalion, The King's Own Yorkshire Light Infantry, with motor-carried machine guns and mortars, passed over the flank and rear of Strawberry Hill in waves, covered by a battery of field guns firing over open sights. The attack consisted of a company of light tanks as the first wave. They were followed by the light infantry who, in turn, had two companies of light tanks behind them, the last of which was taken in flank by a company of Northern medium and light tanks coming southwards from the neighborhood of

Carden-Loyd Machine Gun Carrier

the Jolly Farmer Inn. There ensued a most entertaining mêlée in which the Carden-Loyds (simulating light tanks) dodged about like infuriated wasps, trying to elude their larger and heavier opponents. In the tumult and the dust, the task of the antitank gunners in distinguishing friend from foe became virtually impossible." Another rear guard action, August 30, in which the Reds alone had fighting machines, elicited the following: "Nothing had been heard of the Red medium tanks, and rumor says that they remained quiescent in Savernake Forest throughout the entire day and the early stages of the night. At this period the fog of war set in, and was in no way reduced by the presence of an effective Salisbury Plain mist which reduced visibility to less than fifty yards. An odd intermixture of friend and foe began which did not end until well after the cease fire. * * * Shortly after



Dragon, Mark III

dawn, while the mist provided an excellent substitute for the natural darkness of the previous night, Reds' medium and 'light' tanks were sent across country to intercept Blue's passage to the Roon crossings. At this point confusion became complete. The tanks found their way with exceptional skill to the point indicated * * *. The infantry of the two sides became intermingled in a way which would defy the greatest skill in description possessed by an honest historian."

Tanks:

The British have as yet no light tanks, though a five-ton caterpillar machine, designed for a maximum speed of thirty miles an hour, is now under construction. Particular effort is being made to develop light tank tactics by using a number of Carden-Loyd Mark VI machines to simulate light tanks. These machines are agile and inconspicuous, but are only partially armored and lack the ability expected of a light tank to surmount obstacles. The one-man machine, that caused quite a stir two years ago, is now in disfavor because its operation imposed too great a burden on the driver-gunner. Even the lightest machines, Morris-Martels and Carden-Loyds, are now designed as two seaters. Some two hundred and fifty of these machines were available for the 1929 experiments. At least six different models of the Carden-Loyd machine have been produced to date, the principal changes being towards enlarged fighting compartments and improved running gear. The fourth model of this series was supplied with wheels for the road and tracks for cross-country going; had four ten-inch rubber tired track wheels on each side; and used rigid track suspension. Mechanical performance was fairly satisfactory, but the machine was unnecessarily rough riding. In the fifth model, an effort was made to relieve the jolting by mounting the track rollers in pairs on rocker arms. The latest model is considered an improvement over previous efforts, particularly with regard to track durability. Some of these machines, painted so as to be identified as representing light tanks, were assigned to medium tank battalions this summer to permit experiments with tank organization and tactics.

The Vickers medium tank, though hot, noisy, and underpowered, is far superior to the best of the World War tanks. It carries machine guns mounted for simultaneous fire to the front and flanks, and a three-pounder cannon capable of all-around fire. An interesting feature of this machine is its air-cooled engine which was especially designed for tank use. It has proven to be less troublesome than the water-cooled motor; is immune to freezing; and has shown high efficiency in hot climates. The British are apparently well satisfied with the air-cooled type of engine, because they have now installed it in their latest armored tractor (dragon) for medium artillery, and are using air-cooled motors in their experimental tanks. Units equipped with these machines can march fifty miles a day for six days out of seven. It is estimated that about two hundred and fifty of these machines have been built. They are now standard equipment for tank battalions, all World War machines having been discarded.

Caterpillar tracks for tanks have received constant attention, because the track is the least durable and most

troublesome part of the machine. The demand for high speed has put track designers to the test. As with automobile tires, it is the pace that kills. The best tires that Major Seagrave could get for his famous "Golden Arrow" were guaranteed for only two minutes at the speed he requires, though at ordinary speeds, the best commercial tires easily withstand fifty thousand miles of wear. The riveted track plates used on the Vickers Medium Mark I were replaced with steel stamped plates on the Mark II. With these plates, the track pins and bushings had to be replaced after one thousand miles, but the plates themselves were still in good condition. Further improvements have been made which give the track an estimated life of three thousand miles at speeds between twelve and eighteen miles an hour.

Three other endless tracks are worthy of note. The Jackson ball and socket track, first used on the Martel tanks, was designed to permit lateral motion of the track plates, so as to facilitate turning. Lubrication of the socket joints proved to be difficult and ineffective, and was finally eliminated altogether. Theoretically excellent, the Jackson track was a practical failure. A rubber jointed track has now made its appearance—no rubbing surfaces; no lubrication; some lateral flexion; noiseless; no appreciable stretch, hence no need for adjustment; fairly simple manufacture; fewer jolts than with the all-metal tracks; two thousand five hundred miles without maintenance and still in excellent condition. These excellent qualities are somewhat neutralized by the excessive weight of the track assembly. The Kegresse rubber and fabric track has passed through several tests and development stages. Originally invented in Russia, it has been highly developed in France and extensively tested in England. The latest design has driving lugs spaced along each side of the endless fabric band, and rubber padded metal shoes. On hard roads, the metal shoes take much of the wear; on soft ground, the entire bearing surface makes contact and thus reduces the unit pressure. Advantages claimed for this track are: good capacity to cross rough country, no joints, no lubrication, easy to replace worn lugs or shoes, no damage to roads, lighter and possibly less vulnerable than metal tracks, silent, permits higher speeds than do most metal tracks. On a half-track vehicle carrying two thousand pounds and dragging a field gun, this track is said to have gone two thousand five hundred miles without much deterioration. For similar duties, the French expect their latest Kegresse tracks to give seven thousand five hundred miles of service. Although the French are equipping some of their light tanks with Kegresse tracks, the British appear to have used the Kegresse on half-track trucks only.

Two of the British experimental tanks of recent design indicate the trend of development. The first of these, a Vickers machine weighing nearly thirty tons, was constructed in 1926-27. It carries four Vickers machine guns, one of which is mounted for antiaircraft fire; and one three-pounder gun capable of all-around fire. Maximum speed over twenty miles an hour; controls, hydraulic; engine, air-cooled, said to be the most powerful of its kind in existence, probably Diesel. The fighting compartment is separated from the engine room by a double bulkhead, and is ventilated by means of a fan. The driver is placed

farther forward than in any previous model, so that he can see obstacles encountered in cross-country driving. Tanks of this weight are not regarded as suitable for normal assignment to a mechanized force; but as the need for their use may arise, it was considered advisable to build an up-to-date pilot model.

Satisfactory tests of this heavy machine were followed in 1928 by the construction of a sixteen-ton tank of similar design. The new medium machine is intended as the principal weapon for decisive action in a mechanized force. It has a sustained speed, on normal terrain, of sixteen miles an hour; and is capable of making thirty-two miles an hour if pushed. Other characteristics are briefly as follows: armor on vital parts proof against .8" caliber bullets, elsewhere .303" armor-piercing bullets; ground clearance about sixteen inches; well-sprung suspension; no special protection against gas; equipped with radio phone; engine in rear, one hundred and eighty horsepower air-cooled Armstrong-Siddeley. The crew consists of four men: driver well forward; first gunner with an all-around-fire three-pounder gun and a .303 Vickers machine gun mounted together; second gunner with a pair of .303 Vickers machine guns; third gunner with two .303 Vickers machine guns, of which one is mounted for anti-aircraft defense. Though not so heavily armored as the French NC model 1927, this machine has more speed and more fire-power than any other known tank of its size. It is so far superior to the present standard medium machines that Great Britain would no doubt be pleased to sell the older models to any prospective enemy.

The Mechanized Force:

The variety of machines contemplated for use in British mechanized forces is rather surprising. There is an evident tendency to create a special vehicle for each particular type of duty, though multiplicity of types means confusion in supply and operation. The caterpillar machines proposed include: one-and-a-half-ton machines, like the Carden-Loyds and Morris-Martels, primarily for reconnaissance and for duty with the infantry; light tanks for reconnaissance and combat; medium tanks for decisive combat; artillery tanks for the close support of other fighting machines; special antiaircraft gun mounts; dragon for hauling medium artillery. Wheeled vehicles range from the seven horsepower Austin scout car to the thirteen thousand five hundred pound Lanchester armored car, with two, four, or six-wheel drive. In addition, there are many different types of trailers. The extent to which experiments have been carried has given rise to an assumption that many of the experimental types will be available for eventual use in quantities when permanent mechanized forces are organized. The British have purchased manufacturing rights on some promising foreign products, have borrowed progressive technical methods wherever they could be found, and have spent money liberally on numerous different experimental models. It has finally become apparent that the light tank is essential to the formation of a properly balanced mechanized force. An increasing number of British officers in the using services are becoming light tank enthusiasts; but this latest change in their desires has hardly had time to register on the drafting

boards of the designers. When the British develop a good light tank, some of the present types will no doubt go into the discard, and with them will go much of the confusion from British thought on the composition of a mechanized force. Efficiency in a mechanized force as a whole demands simplicity in all things—the fewer the types of vehicles, the better.

A mechanized force, like the navy, must have well-established bases, advanced depots, and efficient communications. Supply governs mobility. The force commander will naturally exploit the resources of the theater in which he operates, and by paying cash for what he needs, may be able to reduce his demands upon the normal supply agencies for food, oil, grease, and gasoline. However, he must rely upon stores carried, those delivered by airplane, and the normal supply agencies for spare parts, ammunition, and other items that are not locally procurable. The proper organization and efficient operation of supply echelons is vitally important to a mechanized force, for unlike men and animals, machines must have full rations.

The old phrase, "fire and movement," takes on new significance in British mechanized tactics. The fighting machine crews are protected by armor; they fire while moving and their movement often involves shock action. The fire-power of the modern machines is formidable; the speed with which they charge increases the terror inspired by their power to crush. If the ground is too rough for accurate running fire, the machine can use shock action; or move to a more favorable area and renew the attack with better chances of success. Fire for destructive effect may be supplemented by the release of gas or smoke from containers in the machine. With comparative security, provided by speed and armor, the machine can employ a more effective combination of methods than is now possible with any other combat agency. The fighting machine has become the strongest "triple Threat" member of the combat team.

British mechanization experience places a greater premium than ever upon leadership. The new force will require the firm guidance and control of a master's hand to exploit its powers to the full. On suitable terrain, a mechanized force has more mobility, more fire-power, and more crushing power than cavalry. Like cavalry, it can operate for a limited period independently of other troops; and for a few days, can cut loose from external sources of supply. It can create opportunities for decisive action, and can then concentrate quickly upon the decisive point. It can move much more rapidly than foot troops, and is less vulnerable to gas and air attacks. By threat alone it can immobilize infantry that lacks effective protection. In short, a mechanized force, even with the present crude machines, is a powerful weapon that will demand from its leader sound judgment, quick decisions, and impetuous bravery on the battlefield. To find these qualities fully developed and combined in one man is rare indeed.

The 1929 mechanization program, involving as it does the disbandment of the armored forces of 1926-27-28, is bitter medicine for those who labored to build up that force. They would prefer to maintain it intact, and develop it as a technical and tactical laboratory for future mechanized units. Effective methods for reconnaissance

and the transmission of information about the enemy and the terrain, require close cooperation between ground machines and aircraft — cooperation which can be developed only by combined training. Night marching, particularly when there has been no opportunity for previous reconnaissance of routes, should be practiced to determine powers and limitations. Methods of control must be developed; the use of command planes, radio, special maps, navigation aids, and other devices that can aid the commander, must be developed. New forms of combat, with increased speed in all phases of the operations, should be worked out, so that the full powers of the new weapons can be utilized. These problems can be solved only in an actual mechanized force, like the one that was recently disbanded. There were and are many excellent reasons for the continuous maintenance of such a force. However, its maintenance involved heavy expense. The British authorities considered that the possibilities of available equipment had been amply demonstrated, and that new equipment would be required to justify further operations of a mechanized force. While the new machines are being built, the old ones will serve to carry mechanization ideas into the infantry and cavalry. To discontinue the armored force even for one training season means the sacrifice of much progress that has already been made; but the sacrifice will be well justified if it opens the way for changes in the organization, equipment, training, and tactics of infantry and cavalry.

WIDER HORIZONS

Continual change is the principal feature of British mechanization. Rapid changes naturally result from experimental development work; but the cause of these changes—technical and scientific progress—is a continuing factor which will be increasingly potent. For thousands of years the battlefield mobility of combat troops has remained practically constant. Now comes the fast motor-driven fighting machine, and with it the certainty of drastic changes in the tactics of land warfare. Navies have improved their weapons and their mobility simultaneously; consequently, modern naval tactics have evolved gradually. If the navy had passed at one bound from wooden galleys to armored cruisers, what would have happened to wooden galley tactics? Centuries of tactical evolution would have been condensed into a decade of tactical revolution. A similar decade now confronts the army, and it will be a period of intense activity for officers who seek to keep abreast of the times. The cost of a fighting machine is small compared to that of a ship; and with the world's automotive resources at the disposal of military designers, technical development will be far more rapid than is possible in naval practice. Army commanders of the future will have their fleets of armored ships on the battlefield. The presence of fast fighting machines will modify the tactics of other combat elements; and as the machines are improved in mechanical design, their own tactical uses will change. If we may judge from naval experience, and from facts already established by British experiments, the mechanization of the ground troops in the army will act as an antidote for stagnant tradition.

The Future of Infantry

CAPT. CHARLES L. BOLTÉ, Infantry

III[1]

INFANTRY EQUIPMENT DEVELOPMENT PROJECTS

CLOSELY linked with the changes that are taking place in the organization of our Infantry units are the developments that are occurring in the nature of the material with which those units are equipped. In fact, the changing nature of such items as weapons, ammunition, and means of transportation, has a very considerable effect upon the type of organization to which the Infantry shall be made to conform. For example, the adoption of a weapon that delivers an increased volume of fire makes necessary provision for a greater supply of ammunition; and this provision may be fulfilled by adding to the supply personnel or by increasing the capacity of mobility of ammunition-carrying vehicles. Again, a reduction in the caliber of a weapon increases the number of rounds in a given weight of ammunition and either compensates for an increased volume of fire or reduces the number of supply personnel necessary to maintain an unchanged volume of fire. Still again, the logical adoption of commercial types of motor transportation may have the effect of altering the strength of small Infantry units so that they may be carried as such in the motor vehicles. Hence, while there is an ever-present demand on the part of the military forces for developments in the means of warfare, and there are, therefore, taking place constantly changes and improvement in the many items of Infantry equipment, nevertheless the organization and the tactical methods of the Infantry are based upon the powers and limitations of the means at the time available.

A recent and familiar example may be used to illustrate how Infantry organization and tactics conform to developments in weapons, and how subsequently new weapons and new organizations and tactical doctrines come into being to meet the new problems that have arisen. Before the World War the small-caliber rapid-fire weapon, typified by the machine gun, formed but a comparatively insignificant part of Infantry armament in any army. The war saw the rapid and logical development of the machine gun, as the stabilization of the forces and the need for conserving men gave greater opportunity and created greater need for the employment of a weapon that would deliver a large volume of controlled fire from a single source. There resulted marked changes in the tactics and organization of Infantry. Massed and linear formations presented highly favorable targets to hostile machine guns and had therefore to be abandoned. Open, dispersed formations were adopted, and the doctrine of infiltration came to the fore. The machine gun became an essential part of the Infantry battalion, although it was not until after the war

[1] For the first and second papers of this important series, see INFANTRY JOURNAL for September and October, 1929.

that our Army made the machine gun company an organic part of the battalion. The Infantry cannon, as typified by the 37-mm. gun, was devised for the primary purpose of combating machine guns, and as such became an integral part of the Infantry regiment and, at least tactically, of the battalion. Still the tremendous fire-power of the machine gun and the tenacity which marked the machine gun defense kept the balance of success depressed in favor of the defending force. It is hardly too much to say that even to the end of the war the machine gun ruled the battle field. But no weapon or method of warfare has ever held the field undisputed and unmatched, and the threatening supremacy of the machine gun had to be met. A new and astounding weapon, the land battleship or tank, came into being and threw its ponderous weight into the balance on the side of the attacker. Its advent, even in the crude state in which it was during the closing years of the war, gave rise to new tactics for Infantry, both on the side of and against the tank, and was also marked by the construction of antitank weapons. Such examples of the play and counter-play of weapons, tactics, and organization can be found in every war, and we may be sure that the state of flux thus illustrated will constantly produce new weapons, new tactics, and changed organizations. So, knowing as we do that there have been marked changes in Infantry equipment during the past ten years, we may be prepared for still greater changes in the years to come.

The Infantry Board has, as one of its continuing missions, the examination and test, from the viewpoint of the Infantry, of all those pertinent items of equipment which are proposed or devised. It is, of course, not the only agency which examines these items. The technical or manufacturing services, and other using arms are all vitally interested. But the concern of the Infantry in such items as a new small arm, a vehicle for use in the forward area, an improved helmet, or an arrangement for delivering fire against fast low-flying aircraft, forms the guide and basis from which the Infantry Board conducts its examination. Most of the research into mechanized items such as tanks and tankettes is performed by the Tank Board at Fort Meade, Maryland. At present the Cavalry is concerned with the armored car project, and the Coast Artillery with much of the development of the heavier antiaircraft fire weapons and methods. But into all these subjects, and into many more that are the peculiar concern of the Infantry, the Infantry Board looks carefully, with a view to selecting and recommending for approval and adoption as standard those items of equipment which will increase the fighting capacity of the Infantry. The field of examination is a wide one; it includes articles as widely separated as a Monel metal identification tag and a cross-country cargo carrier. During the past year more than a hundred and thirty different items and projects received the attention of the Board. Some of these have been recommended for adoption, some have been definitely rejected, and others have been held for further test and examination.

The Infantry equipment development projects divide themselves generally into three classes. The first includes weapons and ammunition, the second transportation, and the third

all other items of equipment not included in the first and second groups. Into each of these classes there are constantly being introduced new items which have been referred to the Board for consideration as to the suitability of the article for inclusion in the equipment of Infantry units. Some of these items require test by the Department of Experiment, and in this process modifications and changes are frequently found advisable or necessary. The history of the antiaircraft sight for the caliber .30 machine gun is illustrative of this procedure. Some of the items reach the phase wherein actual field test by troops is indicated, and these are placed with the 29th Infantry, the responsible officers submitting reports thereon. This procedure has been followed with articles of clothing, transportation, the 75-mm. Infantry mortar, and the modified 37-mm. gun.

The articles of equipment which mark the major problems that confront the Infantry at the present time are the self-loading rifle, the light tank, a device for controlling antiaircraft fire, and an antitank gun. Each of these problems has been partially solved, but there is still much to be done in perfecting satisfactory solutions. Articles of perhaps a less urgent character, but of considerable importance, are: a cross-country cargo carrier; a suitable weapon for delivering close-range high-angle fire from the forward platoons and companies; instruments for intercommunication between tanks: vehicles for carrying water, wire, and food; and a means for employing smoke locally by the smaller Infantry units. It is possible to examine items within each of the general classes of the equipment development projects, and to learn something of the problems presented and the extent to which these problems have been met or solved.

Within the realm of weapons we may consider the self-loading rifle, a light machine gun of the same caliber, air-cooled machine guns of caliber .30 and caliber .50, the 75-mm. Infantry mortar, the 37-mm. Infantry cannon, a 3-pounder gun, and a number of modifications and improvements in these and other Infantry weapons. The self-loading rifle is an accomplished fact, although there will be changes in the experimental models before the weapon is finally accepted as ready for issue. The caliber will be .276 inches. Loath as we may be to give up the caliber .30 Springfield rifle which has been the mainstay of the Infantryman in our later wars, the requirements of the modern battlefield point to the adoption of an individual firearm which will deliver a greater volume of accurate fire in a short space of time with a lesser degree of exposure and fatigue to the firer. So long as the fire is effective within the limiting ranges which characterize the Infantry fire fight, we can sacrifice, against unarmored formations, the longer range and greater striking force of the caliber .30 rifle. One of the arguments advanced against the adoption of a more rapid firing individual weapon maintains that the rapidity of consumption of small-arms ammunition will be too greatly increased. This argument is met partly by the assurance that the reduced caliber increases the number of rounds in a given weight of ammunition, and partly by the assertion that front-line Infantry units have seldom, if ever, run short of small-arms ammunition except in isolated local situations. The new rifle

will tend to bring the ammunition consumption up to the ammunition availability. In view of the tremendous reserve of Springfield rifles now on hand, it is obvious that there will be no rapid substitution of the .276 auto-loader, but that for the present the arming of the Infantry with the new weapon will be a slow and gradual process, once the weapon has been finally approved. The new rifle will in all probability replace both the Springfield and the present Browning automatic rifles; for, while the latter was originally intended as a weapon delivering automatic fire, it was found unsuitable for this purpose and is used solely as a single-shot weapon.

The trend in Infantry tactics is toward increased dispersion of men, the further substitution of automatic weapons for individual men, and a decrease in the size of the basic fighting groups, according to the doctrine of infiltration. A logical corollary of this trend is the inclusion of a group of machine guns in each rifle company, either as an organic part of the company or an attached unit in the usual tactical situation. It is but a step to the realization that what is needed is a light machine gun, capable of sustained fire, of the same caliber as the individual weapon, namely, caliber .276. This gun has been produced, but is still in an experimental stage. There seems to be little disagreement with the assertion that a group of such weapons is necessary for the establishment of a pivot of fire within the rifle company. Such a gun as that now being tested will be much lighter, more mobile, and less conspicuous than the present caliber .30 machine gun. It is, of course, not to be thought that the present guns will be laid aside; they will continue to form a most essential part of the pivot of fire weapons within the battalion and one of the major defenses against low-flying aircraft. The water-cooled gun has always presented difficulties, such as the consumption of water, the weight inherent in such a weapon, and the distinctness with which escaping steam is sometimes visible. In the attempt to overcome these difficulties, air-cooled guns of caliber .276, caliber .30, and caliber .50 are being subjected to experiment and test.

The caliber .50 machine gun is being definitely considered for inclusion in the Infantry battalion as a weapon for combating tanks and attack aviation. While it has been satisfactorily adapted to antiaircraft tasks from more or less fixed mounts and in the higher echelons, it still presents considerable difficulty as a battalion weapon. The gun itself functions satisfactorily, but the problem of providing a suitable mount for infantry employment is yet to be solved. Moreover, the question as to whether this gun can fire a suitable armor-piercing projectile which will disable the tank which it is expected to combat has not yet been fully solved. The 29th Infantry has been experimenting with a platoon organization, comprising four caliber .50 guns mounted permanently on three-quarter-ton trucks, each being served by an additional three-quarter-ton truck for part of the personnel and ammunition. This equipment was entirely extemporized for initial experiment as to the organization that would be necessary for the inclusion of these guns in the battalion. The guns were fired recently at Fort Benning from the truck mount at towed aerial targets, with fairly satisfactory results.

There is as yet, however, considerable disagreement as to the place of the caliber .50 guns. Many believe that the guns have no place in the battalion, that the caliber .30 guns can give more effective protection against aircraft flying at low altitudes, and that the antitank work can be better done by the modified 37-mm. gun or by a new gun which will both supplant the 37-mm. gun and take over the proposed antitank work of the caliber .50 machine gun.

A rifled 75-mm. Infantry mortar and a modified 37-mm. Infantry cannon are both in existence, and the Howitzer Company, 29th Infantry, is equipped with them. Tests are being conducted, however, with a smooth-bore mortar, otherwise identical with the present rifled mortar, which fires a finned projectile, secures a better shot group, and has a shorter minimum range than the rifled weapon. Satisfying tests have also been made with the Stokes-Brandt and modified Stokes mortars, both of which are muzzle-loading weapons of the types of the familiar war-time Stokes, equipped with a base-plate and a bipod mount. All of these weapons present problems because of their weight and the weight of the limited number of rounds of ammunition that can be carried in the battalion. The antitank capabilities of the 37-mm. gun have not yet been fully and satisfactorily developed, and firing tests are being conducted with a view to developing an efficient fuzed armor-piercing projectile. The firing at moving targets conducted at Fort Benning and elsewhere have shown that the manipulating mechanism of the new 37-mm. gun makes possible a greater number of hits than does that of the war-time weapon. Proposals have been made and partially put into effect to provide a 3-pounder antitank cannon for the tank and possibly for the battalion, and a 2-inch mortar primarily for smoke, but which might give to the leading elements of the assault battalions a more inconspicuous high-angle fire weapon with a suitable minimum range. Thus far, however, these two proposed weapons have not been considered appropriate. The war-time grenade discharger for the Springfield rifle is considered as practically obsolete, as it certainly will be with the adoption of a new individual fire-arm. Some provision will have to be made for high-angle fire by the smallest Infantry units, that is, within the platoon and squad. Grenades of some sort will probably be the solution, but they must provide a maximum of fire effect consistent with a practicable minimum weight.

It would require too much space to describe the many modifications and appliances for the various Infantry weapons which are being studied and tested with a view to making the Infantryman and the Infantry unit more efficient fighting machines. Among them are a water-pump and an improved rear sight for the present machine gun, tracer ammunition for the caliber .45 pistol to replace certain pyrotechnics and to assist in target designation, adjustable fuzes for high-angle fire ammunition such as grenades, and recoil reducers or compensators for the rifle and automatic rifle.

Perhaps the most outstanding of the accessories is an antiaircraft sight for the machine gun. The problem of delivering effective fire against low-flying aircraft is wholly dependent upon the facility with which the firer can observe or direct that fire. The

present tentative Training Regulations 300-5 present the latest published methods devised by the agencies at the Infantry School for certain phases of antiaircraft fire, primarily for fire with the rifle and automatic rifle. These methods are based essentially upon the proposition of appropriate leads. In general, the soldier is taught how to shoot ducks, by so aiming in front of the moving target that the projectile fired and the target will meet in space. With the machine gun, the practice has been up to the present to advocate observed fire with tracer ammunition, the gunner avoiding the use of a sight on the gun. It is now believed that a more effective fire can be produced by so placing and moving the cone of fire that for a part of the firing time it will contain the moving target. This is a marked departure from the theory of selected leads, and is based upon a sight so devised as to enable the gunner to place and move the cone of fire systematically. The sight is still in the experimental state, but it promises to solve the problem of Infantry antiaircraft machine gun fire more effectively than any device heretofore produced.

That class of Infantry equipment embodying generally the items of transportation is divided into what may be called carrying transportation and fighting transportation. By the first is meant such vehicles, both animal-drawn and motor driven, as serve primarily to transport the fighting agencies to the battlefield, and from which the fighting elements can separate themselves upon entering and during combat. To this group belong the escort wagons, water carts, rolling kitchens, machine gun and howitzer carts, motor trucks for personnel and for light tanks, and cross-country cars for command and reconnaissance purposes. By the second division is meant those vehicles in which the moving and fighting characteristics are more or less inseparable. To this group belong the tanks, tankettes, tractor-mounted guns, and armed armored cars.

Two of the present governing doctrines which are having a controlling effect upon the study of transportation equipment, and for that matter upon the Infantry development projects throughout, have to do with the exploitation of the motorized nature of American life and with the threat which aircraft and gas hold for animals in the combat zone. When it is realized that between eighty and ninety per cent of the world's motor vehicles are in the United States, numbering one for every four or five inhabitants, it becomes clear that we should exploit to the utmost the familiarity with gas engines, motor transportation, and high speeds which is uniquely an American characteristic and which may be of great value on the modern battlefield. And when to this condition is added the realization that a mule cannot be made to take cover from an attacking airplane and that an animal is highly vulnerable to missile and gas attack, our objective plainly becomes the extensive substitution of motors for animals. The conservative arguments that animals can go places where motors cannot, and that motors without the vital fuel and oil are worse than valueless, must, however, be given due consideration, and we would be dangerously radical to abandon wholly and incontinently the horse and the mule. But the problem of the mule-drawn machine gun carts and escort wagons with the Infantry battalion in the face

of an attack by aircraft is one of vital concern to the Infantry.

It is only common sense to contemplate the maximum use of commercial types of motor vehicles and gas engines, as far as these can be readily adapted to military use. The tremendous supply currently on hand, the ease with which production can be geared up to war-time demands, and the popular familiarity with these types, make it triply wise to adhere to them wherever possible. This policy thus becomes a guide to the Infantry Board and to the other agencies concerned, from which deviations are made only when the military problems cannot otherwise be solved.

Among the transportation items which are occupying the current attention of the Infantry Board are all-steel machine gun and howitzer carts. The former embodies the valuable characteristics of the Mathews mount and some form of antiaircraft adapter permitting ground and aerial fire. Then there are a suitable water cart to replace the obsolete and discarded vehicle which has been so wholeheartedly cursed in the past, a cross-country reconnaissance car which can be modified as a cargo-carrier and which will possess the qualities of lightness and sturdiness to a degree, trucks of ¾-ton and 1½-ton capacities for use in Infantry field trains, and 3-ton trucks for transporting Infantry personnel. A cargo carrier has been constructed on the T1-E1 chassis, which seems to point provisionally to a solution of the battalion supply problem in combat.

The study of mechanized fighting units is being conducted primarily at Fort Meade, Maryland, where particular attention is being devoted to the development of a suitable light tank. The experiments with the medium tank, the proposed pilot model of which is to weigh about fifteen tons, are practically static. Several of the T1-E1 tanks have been manufactured and were distributed for further test after the mechanized maneuvers last summer. An improved T1-E2 model is now being built. This type of tank presents tactical difficulties which in the minds of some are decisively bad. There will always be the necessity for compromise between the views of those who magnify mechanical performance and those who consider the shock or firing characteristic paramount.

The most recent Christie chassis finds a great number of advocates, but it is still to be developed as a finished fighting unit. Its operating speeds have made plain the fact that modern battlefields will witness greatly increased tactical movement, with consequent new problems for the commander. As with all new weapons, the tank, with its characteristics of high mobility, armored protection, firepower, and shock-power, gives pause to the tactician when he considers the extent to which imagination may lead. The tank has its ardent advocates and its sceptical opponents, but the majority of those concerned regard soberly the apparent fact that the tank and its later off-spring will play major parts on future battlefields. There is a demand for lighter tanks, one-man tanks, tankettes, and small, fast, armored tractors mounting machine guns and light cannon, but as yet little in the way of material results have been produced for our Infantry. A one-man tankette has been tested for its track-laying capabilities, but it is still in an infant state.

That general class of the Infantry

equipment projects which includes all other items than weapons, ammunition, and transportation, is large and varied. It contains articles of clothing and individual equipment, such as uniforms, hats, leggins, shoes, a new haversack, a toilet article pouch, an improved diaphragm gas mask, and a mask for tank crews. It contains instruments and communications equipment, such as a machine gun aiming circle, a tank periscope, repeating coils for telephone circuits, an improved type of outpost wire and equipment for intercommunication between tanks. It would require a great deal of space merely to list the many more or less minor articles that have been or are being studied and tested by the Infantry Board and the agencies that assist it. There is hardly a piece of Infantry equipment that has not been viewed with regard to possible or needed improvements; some have been discarded as obsolete, and some new ones have been devised to meet new needs.

It is only thus that the Infantry can be kept up to date as far as available funds and the merited approval of new and improved items of equipment will allow. And all of the articles of equipment suggested, tested, or adopted, must be considered as to whether they fit into the current development of Infantry tactics, and in the light of the effect which they in turn will have on our tactics, on our Infantry organization, and on the methods of training that must be adopted with the new equipment.

Hercules versus Venus

From the Notebook of "General Experience"

THE question as to whether Hercules or Venus was the more powerful was settled by the battle of Pharsalia, fought in the year 48 B. C. Pompey's men shouted as their battle-cry, "*Hercules invictus,*" while Caesar's legions advanced with the cry, "*Venus victrix!*" The lady won.

This battle, while not particularly important, was noteworthy as the first demonstration of the military genius of Julius Caesar.

The New Machine Gun Antiaircraft Sight

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THE problem of developing a satisfactory antiaircraft sight has been present since the first employment of machine guns against aircraft. In spite of the realization of this need, obvious for more than a decade, the factors that govern the tactical requirements, the mechanical construction, and the technique of use of a sight suitable for infantry employment against attacking planes have proved to be so varied and so complex that progress toward a perfect infantry machine gun antiaircraft sight has been slow indeed.

The tactics and technique of antiaircraft fire and, consequently, the essentials to an antiaircraft sight, are determined by the probable nature of future aerial attack. In this regard, without considering the retaliation which infantry may make, the infantry target most vulnerable to such attack is a large column of troops (of at least the strength of a battalion) in march formation. A long, narrow target of this kind offers to the airman a huge linear mark for machine gun fire or bombing, and to deliver either along the long axis of the column requires little accuracy. At present, the most effective method of making this attack is considered to be a very low approach at high speed, utilizing the element of surprise to its full extent. The influence which this manner of attack has had upon the design of the latest antiaircraft sight, and upon the technique of machine gun antiaircraft fire, and the influence of other factors as well, will be set forth in detail herein.

The first and governing requirement for an infantry antiaircraft sight is the necessity for its instant use at the appearance of low-flying aircraft. The safety of infantry troops, when subjected to aerial attack, lies in shooting down the approaching planes before they reach the point at which bombs can first be released upon the troops. This will be, in general, just before the planes reach a point over the end of the column which they approach. Hence, the most important period of infantry antiaircraft fire begins with the first appearance of the attacking planes and calls for the earliest possible application of the full fire-power of the machine guns.

In addition to this important tactical requirement of a satisfactory antiaircraft sight, there must be considered also the necessary mechanical and physical requirements; for a sight inadequate in any of the foregoing respects is valueless. To be mechanically perfect an antiaircraft sight must not interfere with the primary uses of the machine gun—against ground targets.

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Also, the sight must be clearly visible to the firer's eye in spite of the smoke of firing, and it must be placed upon the gun in such a manner that to the firer it is easy and expedient of use. Above all it must cause accurate fire to be placed upon targets which move at a wide range of speeds and whose range, angle of approach, and angle of altitude all vary continuously during the whole flight of the target from the instant it first appears, or comes within a range of one thousand yards, to the moment it falls to earth a casualty, or passes out of range.

Of the physical requisites which are indispensable in the sight, the first is simplicity. As the ordinary soldier should be able to use the sight after a reasonable amount of training, and as, in the event of war, large numbers must be trained speedily in its use, the methods of operating the sight must not be involved. Hence, the sight must reduce, or if possible, completely eliminate mental estimations of the factors of target flight. Furthermore, its simplicity must be such that its operation will become largely mechanical under the stress of combat. With an ideal sight the soldier should be able to lay and fire instantly upon an attacking airplane at its first appearance and thereafter, even when under fire, to keep a continuous and accurate fire upon it without mental effort, regardless of the changing flight factors or the excitement of battle.

Hitherto a sight that measures up to these requirements sufficiently to be practicable to infantry has not existed. Tests of the Forward Area, Peycru, 1925E, and similar sights, and researches upon them, have found them wanting in several common respects. Their low position on the water jacket causes the firer's aim to be obscured by the smoke of firing. This low position also makes the firer's necessary position of aim at high angles of fire extremely awkward and sometimes impossible to assume. Furthermore, the theory and manner of use of these sights is in general so complex that experienced gunners become confused during peace-time firing. Continued estimations of target speed and slant range, with corresponding applications either by adjustment of the sight or by complete change of aim are necessary to insure accuracy of fire. To make these mental estimates and to apply them requires a time period of several seconds. Inasmuch as the entire attack of airplanes is itself a matter of seconds, there is time for only the briefest and simplest of judgments. Moreover, a slight error in the estimation of a single factor will throw the fire entirely off the target.

The only sight at all satisfactory now in use is that with which the German army is equipped. This sight, however, gives only zone, or "fly-through," fire with an extremely small hit possibility. In using the German sight the fire is laid in front of the target and held there while the target flies through it. The present authors analyzed this method of fire in their article on antiaircraft Machine Gun Dispersion in the September number of the INFANTRY JOURNAL, showing that the hit possibility, even at very short ranges and with perfect aim, is so small as hardly to be worth the expenditure of ammunition. The German sight has the additional disadvantage of being mounted close to the water jacket, which results in a poor firing position and in obscuring the target by the smoke.

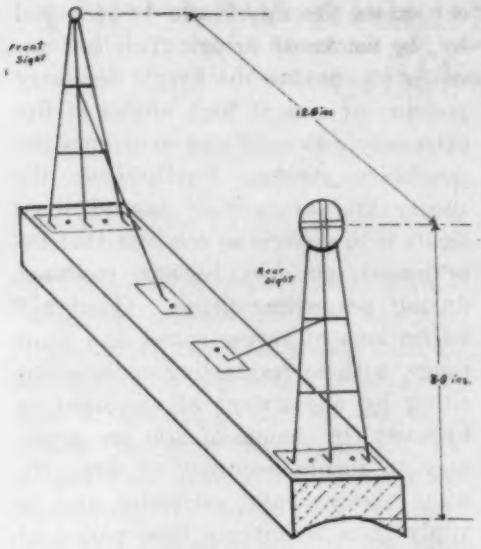

Fig. 1. The Boyd-Greene Antiaircraft Sight for Caliber 30 Machine Gun

Better than the use of any of these sights, perhaps, is the method of adjustment of fire by gunner's observation of tracer bullets. Unfortunately, this apparently simple and easy means of placing and keeping the cone of fire upon the target has serious defects. The fact that the intersection of the path of the tracer and the target—two rapidly moving objects—occurs in mid-air, where there are no other points of optical reference, makes judgment quite difficult. As tests have brought out, all observers of tracer firing make an error in judging the point of strike, even upon ground targets. Furthermore, this error of visual judgment is not made in the same magnitude nor direction by any two observers. No two eyes see a tracer bullet in the same way. Extended firing experience by each gunner might teach him the average size of the error which he makes and the correction for it in firing, but no general rule can be formulated to indicate to new gunners their individual adjustments for the differences between the apparent and real points of strike. Moreover, in antiaircraft firing there is a distinct optical illusion which detracts still more from fire accuracy. This illusion causes the tracers to appear to curve widely in a direction opposite from that in which the target moves. Finally, when fired on a bright day or in the general direction of the sun, tracer bullets become almost invisible.

After a thorough study of other means of antiaircraft machine gun fire, the Boyd-Greene sight (Figures 1 and 2) was developed by Maj. Leonard R. Boyd, Infantry, and 1st Lieut. Joseph I. Greene, 24th Infantry (Department of Experiment). This sight is the result of nearly three years of research and experiment, during which six types of sights have been designed and tried. It is believed that the sight, while far from the ultimate, is based on the principles of antiaircraft machine gun firing which best fill the requirements set forth at the beginning of this article, particularly the requirements of instant application of fire and simplicity of use. Instant fire, in a true sense, is possible only when the estimation of the four elements of flight (speed, range, altitude, and angle of approach of target) can be eliminated by being made mechanical or automatic in the aiming of the sight. In the Boyd-Greene sight the complexities of estimation of target flight factors and their application have been reduced to the lowest point consistent with a reasonable expectation of hits. To accomplish this, it was necessary to sacrifice some theoretical accuracy in favor of simplicity and continuity of operation.

In an earlier portion of this article it was pointed out that the most im-

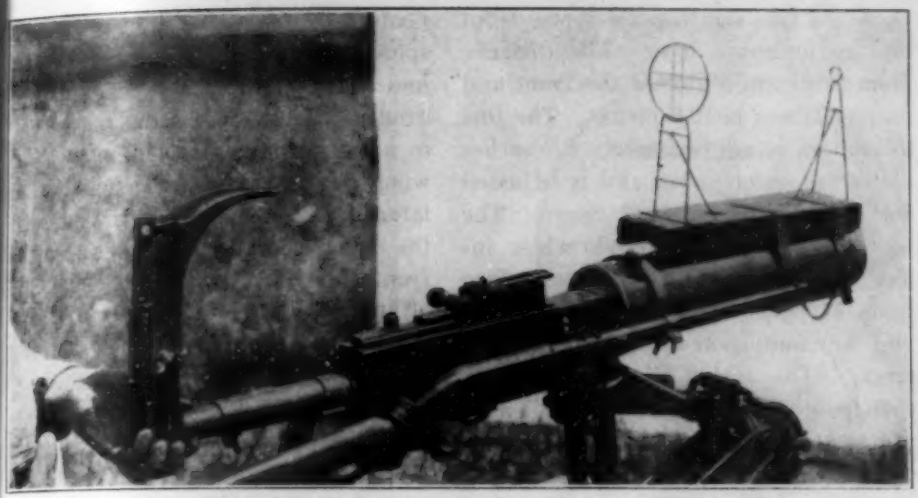

Fig. 2. The Boyd-Greene Antiaircraft Sight Mounted on the Gun. The Caliber 22 Rifle Attached to the Gun Is for Sub-caliber Training

portant and vulnerable infantry target to hostile aircraft is a column in march formation and that, conversely, airplanes that attack along the column are to infantry its most important target. Next comes the direct dive upon infantry from a considerable height; while still another important target is formed by planes attacking or diving upon a column as seen by infantry flank units which may be a short distance—one hundred to six hundred yards—to the side of the main column. The other forms of flight in which attack airplanes may engage offer no direct threat to infantry; hence those outlined were made the chief basis of the sight. For purposes of discussion these may be classified as "*diving flight*, in which the target moves directly toward the firer; *vertical flight*, in which the target passes over the gun; *parallel flight*, in which the target approaches obliquely from either side and passes by the gun and not over it; and *inclined flight*, in which the target is not flying parallel to the ground, such as a dive or a climb seen from the side.

In its basic uses the Boyd-Greene sight is designed so that the gunner can lay and open fire immediately upon the appearance of a target. A single estimate of range is required by which the gunner decides when the target is within the range limit of the sight, which is one thousand yards. At longer ranges he does not fire. The estimation of target speeds is also reduced to one simple decision as to whether or not the speed of the target is less than one hundred and seventy miles per hour. The sight as at present designed is limited to uses against targets whose speed is one hundred and seventy miles per hour or less. As all late types of attack planes have maximum speeds less than this, no decision by the gunner regarding target speed is at present required. Estimations of elevation and angle of approach (or departure) are not necessary in the basic uses of the sight.

The sight (Figures 1 and 2) is com-

posed of two sighting members, front and rear, and a base. The distance from center to center of the front and rear members is 12.8 inches. The line of centers is approximately 8.0 inches above the water jacket and is adjusted for a six hundred yard range. The rear sight proper is a circle whose inside diameter is 3.75 inches. Two pairs of parallel guide wires, vertical and horizontal, are centered in this circle. The inside distance between each pair of wires is 0.6 inch. There are small indicating points at the 45 degree points of the sight circle. There are also small indicating points on the guide wires, dividing the vertical and horizontal radii into three equal parts. The front sight proper is composed of a circle whose outside diameter is 0.75 inch. The method of attachment to the gun of the rough pilot models shown in the illustrations has been improved by making both sights easily detachable from a permanent simple sight base held to the water jacket by clamps.

There are two degrees of method of use of the Boyd-Greene sight: basic and advanced. In the simpler basic use, all men of a given organization can be trained in a brief time to proficiency. This method is sure to place some hits upon the target and, as stated before, has the merit of eliminating nearly every mental estimate on the part of the firer. In order to accomplish this, however, the fire from the gun is distributed over a greater length than is conducive to the best possible results.

In the advanced use of the gun the total length over which fire can be distributed by the sight is divided into three parts or brackets. The use of the proper bracket entails a simple classification of the target into one of two speed groups, one of two range groups, and one of two angle of approach groups. These required decisions are in no way complex as will be apparent when they are described in detail later in this article. In both uses of the sight the target is centered in the front sight circle and is held there at all times during firing, regardless of the relative positions of the front and rear sights (Figure 3).

Both uses of the sight can best be explained by describing the aiming procedure employed against one of the typical targets. The basic method of use against parallel targets is as follows (Figure 4). The front sight is aligned on the target so that the front edge of the target is centered in the front sight circle. The front sight, with the target thus centered in it, is centered in the square formed by the two sets of guide wires of the rear sight. This is the commence firing position. Lead is then obtained by moving the gun so that the front sight circle (with the target remaining centered in it) moves from its centered position in the rear sight guide wires until it touches the rear sight circle.

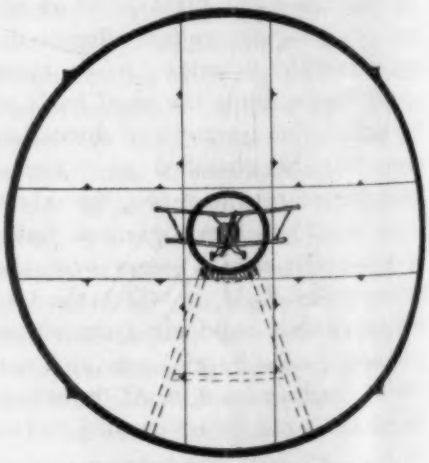

Fig. 3. Diving Combat Target

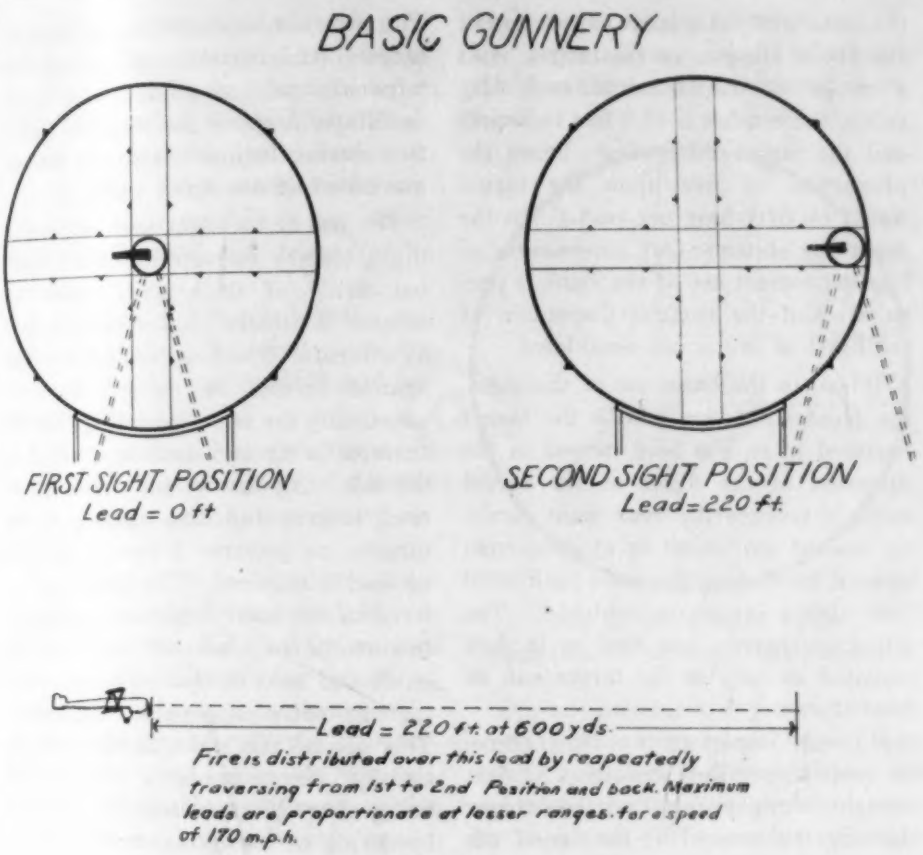
BASIC GUNNERY
FIRST SIGHT POSITION
Lead = 0 ft
SECOND SIGHT POSITION
Lead = 220 ft.
Lead = 220 ft. at 600 yds.
Fire is distributed over this lead by reapeatedly traversing from 1st to 2nd Position and back. Maximum leads are proportionate at lesser ranges for a speed of 170 m.p.h.

Fig. 4

This movement is made slowly and steadily. The direction of movement is determined by the direction of flight line of the target which is the extension of the target's longer axis. This movement of the sight provides, at a range of six hundred yards, a lead of 0.0 feet at the commence firing position and of 220.5 feet, when the outer edge of the front sight circle touches the inner edge of the rear sight circle. During this outward movement, therefore, the fire from the gun will be distributed over a relative length of 220.5 feet along the direction of flight line of the target at some portion of which targets moving less than 170 miles per hour will be included. As a combat target is thirty feet in length it is apparent that the fire of the machine gun will be on the target in the proportion of 30 to 220.5, or during 14 per cent of the whole traverse. It is also apparent that at a given range, whether the target moves at ten miles per hour or one hundred and seventy miles per hour, the same percentage of fire will be placed on the target. As the range decreases, however, the length of the lead bracket made by the outward movement of the front sight as above described decreases in proportion. Because the target length remains the same, the proportion of fire which is placed upon the target increases, until at short range, the correct basic use of

the sight will put a large proportion of the fire of the gun on the target. (At a range of one hundred and fifty yards, the bracket is 55.0 feet in length and the target thirty feet; hence the proportion of fire upon the target would be fifty-four per cent.) In the foregoing statement of percentages of hits the correct use of the sight is presumed and the vertical dispersion of the burst of fire is not considered.

When, in the basic use of the sight, the front sight circle, with the target centered in it, has been moved in the direction of the flight of the target until it touches the rear sight circle, an inward movement is at once commenced back along the same path until both sights are again centered. The complete traverse out and in is then repeated as long as the target can be fired upon.

It is very important that the traverse be made slowly and steadily. At first thought it might seem that the oftener the target is crossed by the fire of the gun, the more bullets will be placed on the target. This is not true. The proportion remains the same whether the traverse be fast or slow. An effort to make a fast traverse detracts greatly from the fire results as the quick back and forth movement tends to throw the sights out of proper alignment and to carry the fire beyond the intended limits of the sight lead bracket. A slow outward and inward traverse, during which the gunner holds carefully on the target, is best to insure accuracy. At the least several seconds should be used for each outward and inward traverse. It is important also that there should be no pausing and consequent bunching of fire at the extremities of the traverse. The traverse should be continuous.

The direction of flight line of parallel targets will normally lie within the horizontal pair of guide wires, which facilitates keeping the required direction during both outward and inward movement of the front sight.

The use of the sight against parallel flight targets corresponds to the combat firing of flank units when the column is attacked along its long axis by aircraft. The basic use of the sight against targets in vertical flight is practically the same, excepting that the traverse is up and down instead of to the side. Against very low-flying vertical targets and also against diving targets, no traverse is needed because no lead is required. The target is centered in the front sight circle and this, in turn, in the square of the rear sight circle and held in that alignment during the entire approach (Figure 3). This use of the sight, fortunately its simplest, corresponds to the combat firing of troops in column in an attack by diving or low-flying aircraft flying along the column.

When the target as seen through the sights, is moving along a path oblique to the vertical or horizontal guide wires, the guide wires must be disregarded and the traverse made along the radius of the rear sight circle which coincides with the line of flight of the target.

The principle of the advanced gunnery of the Boyd-Greene sight is the division of the whole sight bracket as used in basic gunnery into three smaller sight brackets, designated as first, second, and third, from the center of the rear sight outward; and the classification of targets according to range, speed, and angle of approach (or recession) into the corresponding sight bracket.

In the advanced use of the sight, the gunner, as previously stated, must make some simple decisions in order to get the best use of the sight. These mental estimations are as follows:

a. He must judge whether the target moves at a greater or less speed than one hundred and twenty miles per hour.

b. He must judge whether the target is less than six hundred yards distant, or between six hundred and one thousand yards.

c. He must judge whether the angle of approach (or recession) of the target is greater or less than thirty degrees.

The first of these requisite judgments can easily be acquired by observation of the flight of the various types of friendly planes, combined with a knowledge of their usual speeds. Again, the speed of the enemy's planes may also be known approximately. The judgment of range within or without six hundred yards is also a matter of observation and practice. The judgment of the angle of approach, while the most important, is, perhaps, the simplest of all. When the visible length appears to be less than half the real length, whether of the side or bottom, of the fuselage of an approaching (or receding) target, its angle of approach is less than thirty degrees. When the visible length appears to be more than half of its actual length, the angle is greater than thirty degrees. A small amount of practice, even with reduced sized targets, should make gunners accurate in this estimate.

Failure to make these estimates with an exact degree of accuracy is in no way fatal to the effective use of the Boyd-Greene sight in advanced gunnery. Large errors, however, will reduce materially the results which are possible when accurate judgment is employed.

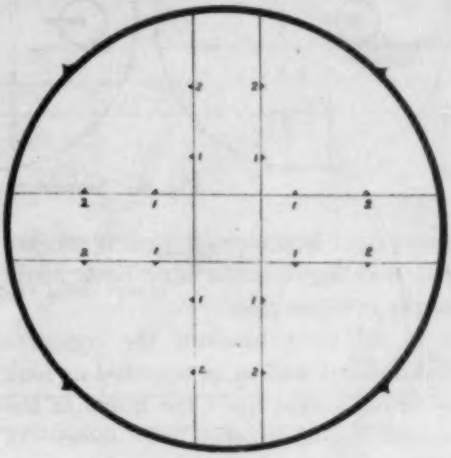

Fig. 5. Rear Sight Circle
Sight Bracket Indicators Are Numbered

For advanced gunnery uses, the rear sight guide wires have upon them small indicators. These divide the sight into the three brackets as shown in Figure 5. The method of sight manipulation for the use of the three sight brackets is as follows:

a. First sight bracket: The sights are aligned directly upon the target as in the basic use of the sight. Fire is commenced and the front sight is traversed to the first sight bracket indicators and back again to the first position.

b. Second sight bracket: The front sight with target centered is aligned upon the first sight bracket indicator. Fire is commenced and the front sight is traversed to the second bracket indicator and back again to the first position.

c. Third sight bracket: The front sight with target centered is aligned upon the second sight bracket indicator. Fire is commenced and the

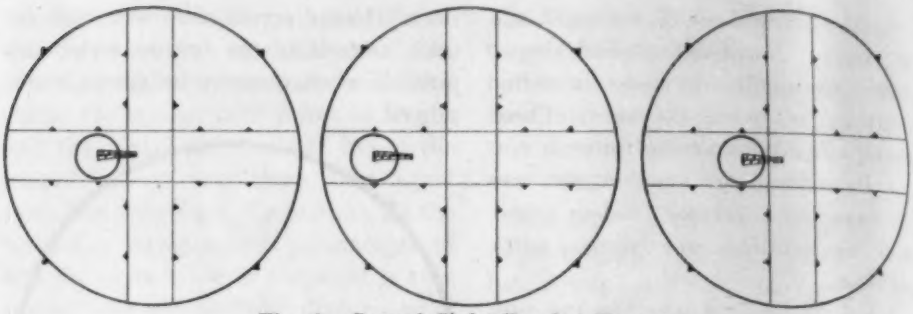

Fig. 6. Second Sight Bracket Traverse

front sight is traversed until it touches the rear sight circle and back again to the first position.

In all sight brackets the complete traverse out and in is repeated as long as firing is kept up. (The limits of the second sight bracket are shown in Figure 5.)

The classification of targets, expressed in the form of directions to the gunner, are as follows:

a. When you see only the end of the target and none of its length, fire directly at it with sights aligned.

b. When the apparent length of the target is less than half the actual length, use the first sight bracket.

c. When the apparent length of the target is more than half the actual length, use the second sight bracket for targets moving less than one hundred and twenty miles per hour.

d. When the apparent length of the target is more than half the actual length, use the third sight bracket for targets moving faster than one hundred and twenty miles an hour at ranges less than six hundred yards.

Figure 6 indicates the manner in which the changes of fire method would be made in firing against a combat target in parallel flight. The uses of the sight against targets in vertical flight are the same as for parallel flight, except that the apparent length of the target is seen from the bottom and the vertical sight bracket indicators are used.

The rules for the use of the sight brackets are based upon graphs in which the leads for speeds of target up to one hundred and seventy miles per hour are plotted with angles of approach from 0 degrees to ninety degrees as a base. The traverses obtained in the three brackets are strictly proportional to the range and are influenced by no other variable when correctly made. On the other hand, the leads themselves vary according to the speed, altitude, range, and angle of approach of the target. Consequently, no sight brackets can be formed which are one hundred per cent applicable. The rules laid down, however, are correct during more than ninety per cent of the flight of each target within the limits of range and speed for which the sight is designed. Hence, the proper use of the sight bracket will give hits on all targets in parallel, vertical, inclined, or diving flight within these limits.

The use of the sight in advanced gunnery is intended to provide the expert antiaircraft gunner a means whereby he can eliminate some of the "waste" fire of the basic gunner. The test firing of the sight showed that as the gunner became thoroughly familiar

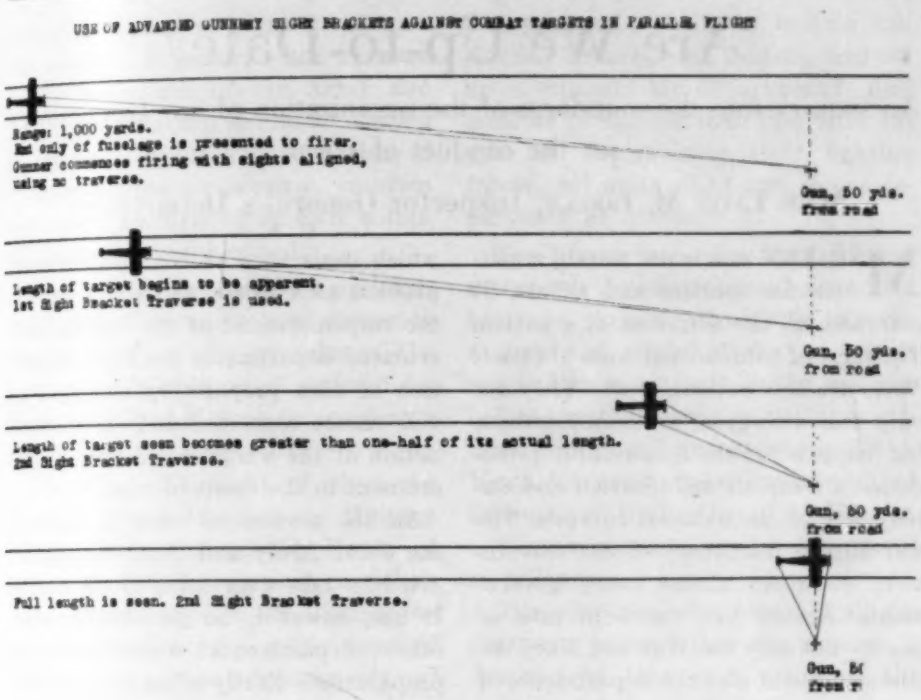
USE OF ADVANCED GUNNERY SIGHT BRACKETS AGAINST COMBAT TARGETS IN PARALLEL FLIGHT
Range: 1,000 yards.
Not only of fuselage is presented to firer.
Gunner commences firing with sights aligned,
using no traverse.
Gun, 50 yds.
from road
Length of target begins to be apparent.
1st Sight Bracket Traverse is used.
Gun, 50 yds.
from road
Length of target seen becomes greater than one-half of its actual length.
2nd Sight Bracket Traverse.
Gun, 50 yds.
from road
Full length is seen. 2nd Sight Bracket Traverse.
Gun, 5(
from r

Fig. 7

with its basic use and theory of fire he formulated rules of his own to cut down those portions of the traverse which he knew would result in firing far ahead of the target or far behind it. Advanced gunnery gives him a set of standards by which he can accomplish this. Basic gunnery, however, must be considered the normal use of the sight under most combat conditions.

In conclusion it should be stated that the Boyd-Greene sight is capable of further development. Whenever the speed of attack planes becomes greatly increased, the rear sight can be enlarged to include the necessary leads. It is quite possible also that changes for the better may be made in the lead brackets. They can be increased or reduced in number, depending upon the aptitude which gunners show in advanced gunnery of the sight.

Twelve pilot models of the Boyd-Greene sight have been constructed, used in an antiaircraft training system, and have been test-fired at towed targets with highly satisfactory results. The designers of this sight are confident that it is sound in principle, but until the sight has been tried by a number of our Infantry organizations, as has been recommended, its final form and value will not be decided.

Are We Up-to-Date?

An inquiry into the soundness of the organization of our Government for the conduct of a war

MAJ. LEON M. LOGAN, Inspector General's Department

MODERN war is not merely a matter for soldiers and sailors. It embraces all the activities of a nation. The days of professional wars are past. Wars are now national wars. They not only deal with great national interests, but require for their successful prosecution a complete mobilization and employment of the national energies. The war-waging machinery of our Government embraces almost every governmental agency that exists in time of peace—not only the War and Navy departments, but also the departments of State, Commerce, Interior, Labor, Agriculture, and the Treasury. In maximum emergencies, many of these departments will have to be expanded. Some of their functions may even have to be transferred to new agencies, as was done in the World War.

Government departments which have a part to play when war comes should make their plans in time of peace. Preparation for war is not a matter merely for the fighting services, acting separately or conjointly, but requires ancillary preparations in such matters as foreign policy, finance, industry, manpower, raw materials, foodstuffs, foreign trade, communications of all kinds, censorship and blockade.

Our present national defense organization provides no machinery either for directing and coordinating preparatory planning for war in time of peace, or for coordinating the efforts of the war-waging agencies in time of war. There is no governmental agency which deals with the national defense problem as a whole, and which defines the responsibilities of the various government departments for the formulation of such preparatory measures as will ensure concerted and coordinated action of the whole machinery of government in the event of war.

In the absence of such an agency, the Joint Army and Navy Board has tried to take over some of its duties. It has, however, no jurisdiction over other departments whose ancillary preparations vitally affect those of the War and Navy departments. It can only invite their cooperation. Since those other departments are operated by civilians who, as a rule, take little interest in matters of national strategy, it is not surprising that the results to date of the labors of the Joint Board have been inconsiderable in matters that pertain to national preparedness.

The lack of any coordinating machinery in matters of national defense not only affects adversely the relations of the fighting services with other government departments, but it places the Congress at a disadvantage when legislation affecting the fighting services is under consideration. Congress is prepared to appropriate a reasonable proportion of the income of the federal government for defense purposes, but it has difficulty in determining how the total amount it decides upon should be apportioned between the land and the naval forces. It has no impartial well-

informed advisors to whom it can turn for counsel. Moreover, when it must decide how much of the Army and Navy appropriations should be devoted to the maintenance and expansion of their respective air services, it often encounters conflicts of opinion within the departments concerned.

Here is a problem within a problem. Not only is there no national agency to coordinate all of the agencies of the government in matters of national defense, but there is none to coordinate the fighting services.

One school of thought, of which the Hon. W. Frank James of the Military Affairs Committee of the House of Representatives is the principal spokesman, proposes to solve the minor problem by establishing a department of defense, with sub-departments of army, navy and air, and perhaps supply.

Much of the energy behind this proposition is furnished by the advocates of a separate air force. They feel, rightly or wrongly, that the air power of the United States will never be developed adequately as long as it is controlled by non-flying officers of the older fighting services, who have no vital interest in the subject, and who are, in some instances, prejudiced against the new fighting service which threatens the traditional prestige of their own arms. To offset the objection that a separate air force will add to the difficulties of control and increase the cost of the fighting services as a whole by triplicating administrative and supply agencies which are already duplicated in the Army and Navy, they suggest the consolidation of all of the fighting services in one department of defense.

Two distinct issues are involved in this proposal. Shall we imitate the British, French, and Italians, and set up a separate air department? And shall we go further than they have yet gone in reorganizing their fighting forces, and unite all of ours in one department of defense?

The former issue has been debated extensively in congressional committee hearings. Anyone who wishes to make a first-hand study of the arguments can find them set forth in the hearings before the Committee on Military Affairs, House of Representatives, Sixty-Ninth Congress, on a Department of Defense and Unification of Air Service.

These arguments may be summarized as follows:

The advocates of a separate air department contend that the air arm is destined to take over many of the present functions of both the Army and the Navy. Since Army and Navy officers have vested interests in their own services, and share an instinctive prejudice against the new rival arm, they cannot be trusted with its development. They will inevitably tend to keep it on leading strings. Such progress as has been made under the existing system has been due largely to the pressure of public opinion.

The existing division of air activities among the Army, Navy, Marine Corps, and Department of Commerce, hinders scientific development by duplication of effort, and increases costs by requiring each to maintain separate organizations and installations.

The British created a separate air force during the World War. Since the end of the war, determined efforts have been made by the combined forces of the War Office and the Admiralty to destroy the new arm as a separate entity. After an exhaustive inquiry

extending over a period of years, the British government has definitely decided to retain the Royal Air Force as an independent fighting service.

Further arguments in favor of a separate air force are that while air formations may be employed as auxiliaries in military and naval operations, they will also be used independently in air operations directed against the vital centers of the national life of an enemy's country. This independent role will become of increasing importance in future wars, and may even decide the issue of national conflicts.

It is contended that a separate air force can furnish auxiliary detachments to the Army and Navy as required. These will operate under the control of the military and naval commanders just as if they were organic parts of the service to which they are attached. At the same time there will be a unified national air effort, and better coordinated technical and tactical training; and, when need arises, the entire air force can be concentrated for major air operations under its own commanders and staffs.

The opponents of a separate air force, on the other hand, assert that air operations will always be auxiliary to land and sea operations. Only armies and fleets can gain and hold positions. No arm which cannot hold positions won can ever decide a war. An air force is dependent upon armies and fleets for the protection of its bases. It cannot by itself protect its airdromes and aircraft carriers against attacks by land and naval forces. Even long distance air operations against the vital centers of the national life of an enemy's country must be coordinated with surface operations, that is, they must be directed by the supreme military or naval commander in the theater of operations. Hence, from the viewpoint of tactical efficiency, there is nothing to be gained by having an independent air force. There is even a certain amount of danger in the proposition. Air strength required to support imminent land or naval operations may be dissipated in independent air ventures and be unavailable when most needed. The absence of unity of command within a theater of operations would always militate against the teamwork which is essential in battle.

It will be seen that there is much to be said on both sides of this controversy. A separate air department would undoubtedly secure more liberal appropriations from Congress than the separate air services now receive. There is even a danger that it might receive more than its proportionate share, to the neglect of proper provision for the older services.

A separate air department would probably result in a swifter and better coordinated development of American air power. Tactical doctrines governing air combat would be evolved more harmoniously. On the other hand, the value of attached air forces supporting armies and fleets would probably be less than under the present system whereby Army airmen are trained Army officers able to cooperate intelligently with the ground combat, and Navy airmen, naval officers well versed in the technique of fleet reconnaissance and gun spotting.

The decision of the British to retain their separate air ministry after a ten years' trial is undoubtedly a weighty argument in favor of a similar organization in our country. The fact that the French and the Italians are both developing their air forces as separate

depend, upon good team-work; but paratory Committee for National Mo-

fighting services may well cause us to question whether our conservatism is based upon reason or upon inertia.

When we come to consider the larger question of a department of defense we should also give serious thought to what these other nations are doing in the matter. Their defense problems are essentially the same as ours.

The idea of combining the three fighting services into one department of defense has been seriously considered by all the great military powers of Europe. So far all of them have rejected it as impracticable on the ground that administrative unification would call for an organization so ponderous that it would bog down by its sheer weight. Decisions would have to be made by the minister of defense on such a wide range of problems that no one man qualified for the task could be found. The heads of the sub-departments of the organization would be assistant ministers or secretaries without cabinet rank, and therefore inferior in power and prestige to the heads of less important departments of the government. If they were given cabinet rank, each would claim to speak for his department and the chief purpose of the consolidation would be destroyed. Without cabinet rank, statesmen and administrators of national reputation willing to accept appointment would be hard to find.

The chief objection to a department of defense, however, was voiced in England in 1927 by Earl Balfour. He said that he had had much sympathy with the idea of setting up a defense ministry, but had been forced to reject it,

> not because it forces coordination on us where coordination is not required, but because it is wholly incapable of giving us the degree of coordination which seems to us absolutely necessary. What a ministry of defense proposes to do is to coordinate the fighting services. But what are the fighting services? The fighting services are the cutting edge of a defensive mechanism which includes every department of state, and all the national energies which these departments control or direct. Now it is surely self-evident that you cannot possibly coordinate all the forces of a nation if you limit your coordinating machinery to the three fighting services.

The British solution of the problem is to direct and coordinate not only the three fighting services, but also all other departments of the government which have parts to play in national defense, through the Committee of Imperial Defense. This committee is composed of all the members of the cabinet, the chiefs of staff for Navy, Army, and Air, and the head of the Civil Service, who is Permanent Secretary to the Treasury. Other ministers, officials, and private individuals are invited to attend its meetings. There are a permanent secretariat and a number of sub-committees which deal with questions such as supply, manpower, trading and blockading, air raid precautions, censorship, war emergency legislation.

The Committee of Imperial Defense is an advisory body. It has no powers of decision. It provides for the continuous study of defense problems by cabinet ministers, the fighting services, and civilian officials. It is inter-departmental, but does not impair the responsibility of department chiefs. Its secretary, Sir Maurice Hankey, says of its methods of operation:

> It depends, as any system dealing with such immeasurable forces must

depend, upon good team-work; but nowadays team-work is not only the aim of the fighting services and indeed of the whole public service, but it is essential under the conditions of the modern world to that complete grasp and clear vision of the consequences of scientific warfare, which must be reckoned among the best securities for the maintenance of peace.

No one can read the reports of the Committee of Imperial Defense without realizing how far we in this country are behind in the preparation which must be made by a government as a whole in time of peace if it is to be able in the event of war to throw the whole national strength at once into the conflict.

France, Italy, and Japan all have supreme national defense planning and coordinating agencies organized along lines similar to those of the British Committee of Imperial Defense.

The French Supreme Council of National Defense is composed of the heads of the different ministries. It examines all questions of national defense which require the cooperation of two or more ministerial departments. It is assisted by a planning commission composed of representatives detailed from all departments, which studies all questions which are to be submitted to the Supreme Council. This commission has a permanent secretariat which prepares and coordinates the work of its four sections.

The Italian Supreme Joint Defense Commission has an executive committee composed of the heads of executive government departments. The committee is assisted in its deliberations by the respective chairmen of the Army Council and Board of Admirals, the Commander-in-Chief of the Air Force, and the Chairman of the Preparatory Committee for National Mobilization. This last named body has been set up for the study of all questions relating to the utilization of all national activities, and the preparation, organization, and use of the country's resources for military purposes. Its organization is similar to the French planning commission referred to above, except that it includes from six to ten representatives of scientific, industrial, and national economic interests.

The Japanese National Defense Committee is more rudimentary in its organization. It is composed of the Prime Minister, the ministers for Foreign Affairs, Finance, Army and Navy, and the chiefs of the Army and Navy General Staffs.

Here again we in the United States have to consider whether we are right in allowing our Council of National Defense, which has not met since 1920, to fall into desuetude, when all of the other first class powers find such a body essential to national preparedness. Our Council, unfortunately, came into being only a few months before our entrance into the World War. Its organization was sketchy; its duties were little understood even by its members. It tried to be an operating instead of a purely advisory body. It was soon superseded by special boards and commissions.

In this writer's opinion, the Council of National Defense should again be set up with an adequate organization and carefully defined advisory powers. Above all, it should be provided with a working force drawn from all of the government departments which have a part to play in time of war. The first tasks to be assigned to it should be to inquire into the merits of both of the issues which have been discussed in

this article, and to make definite recommendations as to the need for and practicability of a department of defense, and the desirability of establishing a separate air department. When these issues have been definitely disposed of, it will be in a position to undertake the too long neglected work of coordinating national plans for use in war.

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Showing the Difficulty of Arresting a General

From the Notebook of "General Experience"

AT Chickamauga, General Willich, in command of a brigade, had in some way displeased his superior, General Rosecrans. General Willich was sent for and notified that he could for the present consider himself under arrest. Then the following dialogue occurred:

General R.: Consider yourself under arrest and leave your sword here until your case is tried.

General W.: Yes, yes; I will consider myself under arrest; so soon as dis fight is over, I'll come and fix him up.

General R.: But, sir, I want you to consider yourself under arrest now.

General W.: Of course I do, and as soon as I gits off dis fight I'll be up and settle dis thing.

General R.: But, sir, I can't let you go into this fight. You are under arrest. I will assign a commander to your brigade.

General W.: You send an officer to fight my poys. He can't do it—dey don't know him. Me dey know; I teach dem; I fight dem; and none of the poys know what to do or how to fight only when I goes with dem. My poys belong to me. Yes, me, General Willich—I command the prigade and I must fight the prigade.

General Willich did fight his brigade.

The Lincoln Forgery

A Discussion

CAPT. JAMES P. MURPHY, Infantry

We have in the Army an authority on Lincoln. He is Capt. James P. Murphy of the Infantry. He had an important hand in exposing the recent Lincoln forgery that appeared in the Minor collection of alleged Lincoln documents. The present article by Captain Murphy is therefore of unusual interest on account of the authority of the writer. It also shows how authentic history is produced. This should be of special interest to us of the Army, for when we estimate a military situation we are in fact trying to set down the story of contemporary military events as accurately as possible. We hope that readers of the INFANTRY JOURNAL *will find both pleasure and profit in reading Captain Murphy's present paper.*—EDITOR.

TO me the most pathetic scenes in all literature are of Lincoln lying with one arm across the grave of Ann Rutledge, and sitting, his face buried in his palms, tears trickling between his fingers and sobbing to a friend: "I can't bear to think of that cold rain beating upon her grave."

Thus the romancers would treat the traditional love of Lincoln and Ann Rutledge. But in the absence of tangible facts, this vague tradition is but slender nourishment for the imagination. A few patched-together references, an occasional letter, records of a scattered group of places and people completely outside the legendary circle of these two to whom for a brief period it was all in all—such scant fare was all that the most industrious research supplied. Then the *Atlantic Monthly* announced for publication a serial by Wilma Frances Minor entitled Lincoln the lover, which purported to contain hitherto unpublished letters from Lincoln to Ann Rutledge and Ann to Lincoln. This material was announced as the first documentary record of the love of Lincoln and Ann Rutledge, an episode which careful students of Mr. Lincoln's life have generally considered largely apocryphal.

Those of us who engage in historical research are likely to assume that everyone will know what tests to apply in order to establish the authenticity of a series of historical documents, and will possess the knowledge necessary for the successful application of those tests. The assumption is unwarranted of course. Rarely will all possible criteria suggest themselves even to highly intelligent persons without historical training, and more rarely still will they possess the specialized knowledge without which the criteria are useless.

In view of this fact it will be worth while at least to itemize the tests which a collection such as the alleged Lincoln documents published serially in the *Atlantic* for December, 1928, January and February, 1929, should pass before its genuineness can be accepted.

First come the purely physical criteria. Is the paper of the proper age, and is the ink that of the period in which the documents are supposed to have been written? Then, if the documents purport to be the work of a well-known character, comes the

question of handwriting. Does it resemble that of letters and papers of undoubted genuineness? Next, is the question of general content. Do the contents agree with what is known from other sources on the subject? Are the sentiments expressed in any given document in harmony with the known views of the person who is supposed to have written it, or even with his general character as established beyond dispute? Finally, do specific instances mentioned in the challenged documents check with historical fact?

It is not often that all of these tests can be brought against a body of material so effectively as in the case of the Minor collection. Almost every item revealed such serious flaws that belief in the genuineness of the entire group early became untenable. Recognizing this, the editor of the *Atlantic Monthly* not only published a statement withdrawing former expressions of confidence in the collection, but recognized the claims of authorities on Lincoln, who early in December, 1928, branded the collection as forgeries.

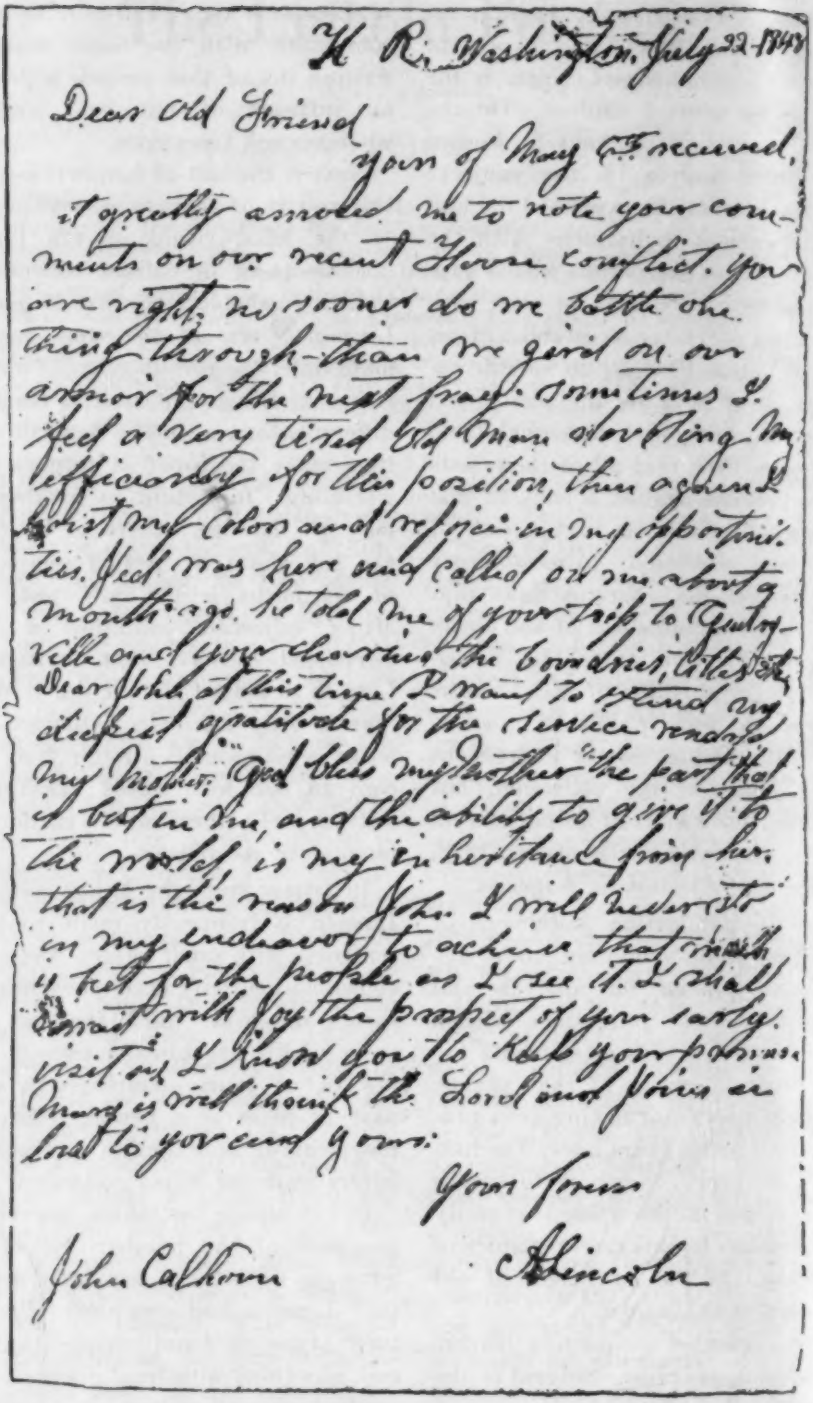
Prior to publication, specimens of the paper were submitted to a distinguished chemist for analysis and were pronounced "pure linen with a trace of cotton," thus establishing the rag content of paper of that period, wood pulp paper not having been produced until many years later. The first concern of every forger is to secure old paper, and on the whole it is easily accomplished. In this case a suspicious resemblance to the fly leaves of old books suggest the source.

There is another disquieting feature of physical appearance. Several of the documents are written in green ink. Green ink usually has an aniline dye base, and aniline dyes were unknown in Lincoln's day. Further, it is not compatible with the usual source of writing ink of that period, which was an infusion of nut gall, available wherever oak trees grew.

Next is the test of handwriting, and this test is of the utmost significance. If the handwriting of the Lincoln documents in the Minor collection is indistinguishable from that of genuine Lincoln letters of the same approximate date, the presumption of authenticity is strong; but if it is markedly different, then all other flaws do more than make the proof of forgery overwhelming. Important as handwriting may be, however, there is little one can say about it. Actual comparison of specimens is the only test. The Minor collection contained a letter purported to have been written by Lincoln to John Calhoun, dated Washington, July 22, 1848. Opopsite this letter is reproduced a letter from Lincoln to his wife dated Washington July 2, 1848, three weeks earlier, for purpose of comparison.

In letters from the Minor collection Lincoln is frequently made to begin sentences with small letters. Letters of known authenticity never show this feature. Moreover, until the last few years of his life Lincoln usually—not always, of course—employed a short dash in place of a period. Such employment of punctuation is absent in letters from the Minor collection.

In explaining the rakish, uneven appearance of the handwriting of the letter to Calhoun it has been argued that Lincoln had two definitely distinct styles of handwriting—the formal, identified with legal documents or public business, and the more rambling and haphazard hand of friendly and familiar intercourse.



H R. Washington July 22 1848

Dear Old Friend

your of May 6th received, it greatly amused me to note your comments on our recent House conflict. You are right, no sooner do we battle one thing through - than we gird on our armor for the next fray. sometimes I feel a very tired Old Man over-flowing my efficiency for this position, then again I glory in my colors and rejoice in my opportunities. Jed was here and called on me about a month ago. he told me of your trip to Quincy-ville and your charming the boarders, Gillespie, Dear John, at this time I want to extend my deepest gratitude for the service rendered my Mother. God bless my Mother "the part that is best in me, and the ability to give it to the world, is my inheritance from her." that is the reason John. I will endeavor to in my endeavor to achieve that wealth is best for the people as I see it. I shall await with joy the prospect of your early visit and I know you to keep your promise. Mary is well thank the Lord and joins me in love to you and yours.

Yours Truly

A Lincoln

John Calhoun

One of the Letters from the Minor Collection

(Reproduced for purposes of comparison and criticism only)

Let us compare a reproduction of a collection does not square at all with

Washington, July 2. 1848

My dear wife

Your letter of last sunday came last night. On that day (sunday) I wrote the principal part of a letter to you, but did not finish it, or send it till tuesday, when I had procured a draft for $100 which I sent in it. It is now probable that on that day (tuesday) you started to Shelbyville, so that when the man by reaches Lexington, you will not be there. Before leaving, and you make any provision about letters that ought come to Lexington for you. Write me whether you got the draft, if you shall not have already done so, when this reaches you. Give my kindest regards to your uncle John, and all the family. Thinking of them reminds me that I saw your acquaintance, Newton, of Arkansas, at the Philadelphia Convention. We had but a single interview, and that was so brief, and in so great a crowd and confusion of things generally, that I am quite sure I should not recognize him, if I were to meet him again. He was a sort of Whig, there now, having the right, in his own person, to cast the three votes of Arkansas. Two or three days ago I sent you uncle John, and a few of our other friends all a copy of the speech I mentioned in my last letter; but I did not send any to you, thinking you would be on the road here, before it would reach you. I pass you no news. Last wednesday P. H. Nourse Esq. drew me for a sixth bill of $5.58 cents and Walter Harper Esq. another for $8.50 cents, for

A Genuine Lincoln Letter, Somewhat Reduced
(Courtesy The Abraham Lincoln Association)

Let us compare a reproduction of a letter purported to have been written by Lincoln to Ann Rutledge in 1835 with an authentic love letter written to Miss Mary Owens of Weston, Missouri, one year later.

It is true that not all specimens of Lincoln's writing are exactly similar, but the variations are the result of the writer's age rather than the subject matter. Though the handwriting of the later thirties shows possible immaturities not discernible in later years, letters written as president show clearly the effect of advancing age and mental strain. But the widest variation from these natural causes are as nothing compared with the difference between these two intimate letters of the same approximate period, one from the Minor collection, the other indisputably genuine.

Let us briefly examine an authentic legal document in Lincoln's handwriting from my personal collection. Written in 1842, but six years prior to the purported letter to John Calhoun, it bears not the slightest resemblance, nor does it show any marked variation from other authentic letters written within a decade.

But in ruling out the Lincoln letters we need not depend on handwriting alone, conclusive as that should be. There is the evidence from "known character," so to speak. Does the Lincoln of the Minor letters harmonize with the Lincoln of historical fact? Or are they two different, distinct individuals—so different and distinct as not to be explained as variant phases of the same person? Let us disregard, as being in the last analysis a matter of opinion, the belief that the distorted and unnatural individual pictured as the writer of the letters in the Minor collection does not square at all with the Lincoln of historical fact. Instead, let us briefly examine the evidence from "known character" and authentic source data. Again reference to the letters written from Washington in 1848 is essential. The difference between the Lincoln of these letters and the Lincoln of historical fact is great enough to make a careful student skeptical, even if disquieting suspicions have not previously been aroused. And a skeptical student, if competent, will at once commence the most exacting and exciting of all tests—the search for errors of specific fact.

As this particular examination largely concerns John Calhoun and his relations with Lincoln, some comment upon him is necessary.

John Calhoun came to Springfield in 1830 and continued a resident of the town until his appointment as surveyor-general of Kansas and Nebraska in 1854. Then he moved to St. Joseph, Missouri, and later to Leavenworth, where he spent the remaining years of his life. From 1832 until 1835 he was surveyor of Sangamon County. The county, then considerably larger than now, was being settled rapidly, and the demands for a surveyor's services were greater than one man could satisfy. At the instance of mutual friends Calhoun appointed Lincoln his deputy.

As time went on, Calhoun occupied other public offices. In 1838 he was elected to the legislature from Sangamon County. Four years later he was appointed clerk of the circuit court and held the position until 1848. As Lincoln advanced to a prominent position in local Whig circles, Calhoun gained place in the Democratic party, becoming one of Douglas' trusted lieutenants when that leader rose to na-

tional prominence. Frequently Lincoln and Calhoun clashed in debate, and local tradition, well supported, has it that Lincoln feared no one, Douglas not excepted, more than Calhoun.

With these facts in mind let us examine closely the letter of July 22, 1848. Aside from the fact that it implies a degree of political accord which did not exist, it contains several historical inconsistencies. "Jed was here and called on me about a month ago. he told me of your trip to Gentryville and your clearing the boundries, titles, etc.",—so Lincoln is made to write. Calhoun's trip must have taken place in 1848, or Lincoln, who took his seat in Congress in December, 1847, would not have known about it. But in 1848 Calhoun was clerk of the circuit court, and the records show that he was performing the duties of that office in person. Relatively few legal papers for 1848 remain in the court files, but those that do remain contain his signature under the file date. Several were filed every month—frequently every week—during the entire year. For the month of May—the time most likely, according to the letter, for Calhoun to have made his Gentryville trip—the record is especially complete.

Moreover, even if Calhoun had gone to Gentryville, he could not have had for the reason of his visit that alleged in the letter. "He told me of your trip to Gentryville and your clearing the boundries, titles, etc.; Dear John, at this time I want to extend my deepest gratitude for the service rendered my Mother," and so on. The inference that Calhoun cleared "boundries, titles, etc." for Lincoln's mother is inescapable. But in 1848 Lincoln's mother had no interest in any land at Gentryville. When Thomas Lincoln had removed from Kentucky to Indiana he entered one hundred and sixty acres near the present town of Gentryville, but he never succeeded in obtaining a patent to more than eighty acres. This holding he sold to James Gentry in the winter of 1829-1830, shortly before removing to Illinois.

The last sentence of the letter is also open to suspicion. "Mary is well thank the Lord and joins in love to you and yours," Lincoln is supposed to have concluded. That Mrs. Lincoln was in Washington is a necessary inference. But that she actually was in Washington is extremely doubtful. She had accompanied Lincoln there in the winter of 1847, but in the following spring she and the children had returned to the family home at Lexington, Kentucky. Her own letters show that she contemplated remaining there during July and August, and Lincoln's letters, particularly one dated July 2, show that he was fully conversant with her plans, and did not expect her to join him soon. There is no direct evidence of Mrs. Lincoln's movements from early July until mid-October, but all the information accessible indicates that her presence in Washington on July 22, 1848, is highly improbable.

So much for the letter of July 22, 1848. Numerous other inconsistencies are apparent throughout the Minor collection. In a letter to Calhoun of May 9, 1834, reference is made to a controversy with one Mr. Green concerning the northeast quarter of Section 40. Since 1785 the government system of surveys had provided for townships divided into thirty-six sections, numbered consecutively from one to thirty-six. Natural irregularities occasionally resulted in townships with

fewer than thirty-six sections, but never in one with more than that number. For Lincoln to have inquired of Calhoun—both men being official surveyors—regarding a "Section 40" is unthinkable. In the same letter Lincoln remarks that the "Bixbys are leaving this week for some place in Kansas." Kansas, however, was not open for white settlement until twenty years after the date of this letter. It is doubtful whether even the word "Kansas" was in common use as designating the region it now describes. Most maps of the period referred to describe the vast territory west of Missouri and north of Arkansas Territory simply as "Missouri Territory" or "Indian Territory," while the gazetteers list the word only as the name of a river.

Let us briefly examine the line of descent of these documents. The story of formation and transmission was related with considerable explicitness. For various plausible reasons Lincoln and Ann Rutledge gave each other's letters to a common friend, Matilda Cameron. Matilda added her own diary, and the collection passed to Sally Calhoun, described as the daughter of John Calhoun, Lincoln's friend and benefactor. Sally added memoranda of conversations with her father and letters from Lincoln, and gave the entire group of documents to two friends, Margaret Morrison and Elizabeth Hirth. In time these joint owners transferred it to Elizabeth's brother, Frederick Hirth. With the addition of a letter Hirth is supposed to have received from Lincoln, it attained its final form, and descended through Hirth's widow to Miss Minor's own mother to the present owner.

Serious weaknesses, however, appear. Examination fails to reveal satisfactory evidence that the first two reputed owners of the collection, Matilda Cameron and Sally Calhoun, ever actually existed. Matilda is described as one of the eleven daughters of John Cameron of New Salem, but the Cameron family bible fails to record a Matilda among them. Equally conclusive is the argument against the existence of Sally Calhoun. That John Calhoun's wife was named Sarah Cutter is conclusive, but a letter from the only living grandchild of John Calhoun, who resides in St. Joseph, Missouri, states that she never heard any of her aunts called Sally. This fact is further substantiated by reputable citizens of Leavenworth who were well acquainted with the Calhoun family during their residence in that city.

Thus every test except that of the fitness of the paper has found the purported Lincoln documents in the Minor collection defective. Critical examination showed glaring weaknesses in the line according to which the collection is supposed to have descended. The handwriting of the items which purport to have been written by Lincoln bears no resemblance to that of authentic documents. The content of the Lincoln letters is not in complete harmony with his known ideas on one subject at least, slavery. It is difficult to believe that such wide stylistic differences as have been pointed out can occur in the writing of the same individual. And the number of historical inconsistencies, some of which admit no possible explanation, is very large. By no possibility can the Minor collection be genuine.

Then who fabricated it? We know what sort of person the forger was, for in these documents he has drawn the

outlines of his own character. Considable cleverness dictated the explanation of the collection's formation and descent to the present. The character of Matilda Cameron, exceedingly well drawn, indicates no small degree of creative ability. Wide though superficial reading provided enough information about Lincoln's life to deceive those whose knowledge was not fairly extensive. Only when cleverness, artistic skill, and general information could no longer suffice, and sound knowledge became indispensable, did the forger fail. Certainly he—or she—was not familar with Lincoln's corespondence, either in its original or in its published form. Complete ignorance of the geographical setting of the story was coupled with defective knowledge of the minor characters. Under the circumstances it was only natural that the forger, like the amateur playwright, should overdraw his Lincoln, emphasizing too strongly his best-known traits.

That exposure followed quickly should cause no regret, for the Lincoln of the Minor collection was, after all, a sorry character. What he wrote was full of inflated sentimentality, and the manner in which he wrote it suggested a man no more than half literate. To me, at least, a belief in the common authorship of these documents and the Gettysburg address was impossible—and I much prefer the Gettysburg address.

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Rockne on Football and Pacificism

IN an article on football, which appeared in the *Washington Sunday Star,* September 29, 1929, the author, J. M. Neville, quotes the Army's friendly enemy, Knute K. Rockne, as follows:

"I attended a pacifist meeting this year at one of the great universities. I analyzed the crowd as well and as fairly as I could. I found that, almost without exception, they were physically below normal. I questioned about a half dozen of the chaps regarding football and I found that they were just as anti-football as they were antimilitary. The thought has occurred to me since that the resentment of these men against things military and against football was a natural thing. *These men were lacking in the qualities of courage, physique, loyalty, and such, that are a part of the make-up of the football player and the soldier—hence, their resentment against both*[1]."

[1] The italics are ours.

Our Tanks

MAJOR RALPH E. JONES, Infantry (Tanks)

II

U. S. TANKS AND TANK ORGANIZATION

THE primary purpose of this paper is to present in a clear, concise, and uniform way the essential and interesting characteristics of the six tanks with which the tank personnel of our Army has so far, since the World War, been concerned. To supplement this, the paper will also present a very general idea of tank organization. The six principal tanks that we shall consider are: Mark VIII (heavy); Six-Ton, Model 1917 (light); Ford (light); Medium 23-ton, T1; Light, T1-E1; Christie, Model 1928.

The Mark VIII is a heavy war-time tank jointly designed and built by Great Britain and the United States. One hundred of these were assembled in the United States; the armor plate, the six-pounder guns, and some other parts were furnished by Great Britain. These tanks were finished too late to be of any service in the World War. They constitute an important element of our present tank forces. As it will require years and much money to procure more modern types of tanks in considerable numbers, these Mark VIII tanks cannot be considered obsolete at any time in the near future. Among the characteristics of these tanks are:

Length—34 feet, 2½ inches;
Weight—43½ tons;
Crew—1 officer and 10 enlisted men;
Armament—Two British naval sawed-off six-pounder guns and five cal. .30 machine guns;
Maximum speed—Approximately 6 miles per hour;
Armor—Protects against all cal. .30 weapons;
Power plant—Liberty, 338 H. P., twelve-cylinder engine as designed for airplanes;
H. P. per ton—7.8;
Transmission—Two-speed, epicyclic;
Suspension—Steel rollers, rigidly mounted.

Due primarily to its large size and relatively low speed, this tank is smooth riding and forms an excellent gun platform. It is extremely powerful. It can break down trees two feet in diameter, or can drop a rugged grapnel and drag out by the roots huge masses of barbed wire entanglements. It is roomy and has great fire-power.

This tank is not suitable for an armored force nor as a weapon to accompany foot troops closely. It is suitable for leading (i. e. to smash the way for the main effort) especially when the attack is against an area that is strongly organized for defense with many trenches and wire entanglements. It would be better suited for leading if it were armored against caliber .50 ammunition. By the installation of a more powerful power plant, the speed of the Mark VIII could be materially increased, with consequent addition to its efficiency and value.

The six-ton tank, model 1917, is a light war-time product patterned closely after a similar French Renault tank. During 1918 and the first three months of 1919 nine hundred and fifty-two of these tanks were built in the United States. None of them were finished early enough to be of any service in the World War. These nine

hundred and fifty-two tanks constitute the chief element of our present tank forces. Among the characteristics of this type are:

Length, with tailpiece—15 feet, 7 inches;
Length, without tailpiece—12 feet, 11 inches;
Weight—7¼ tons;
Crew—2 men;
Armament—One 37-mm. gun (old type) or one cal. .30 machine gun;
Maximum speed—Approximately 6 miles per hour;
Armor—Protects against all cal. .30 weapons;
Power plant—Buda, 44 H. P., four-cylinder engine;
H. P. per ton—6.1;
Transmission—Four-speed, sliding gear;
Suspension—Steel rollers and springs, characteristically noisy.

On account of the various springs in its suspension and its relatively low speed, this tank is fairly smooth riding and forms a very good gun platform. It runs over and partly crushes wire entanglements without difficulty and so reduces their effectiveness as obstacles. Its tailpiece enables it to cross trenches materially wider than it otherwise could. It has adequate operating space for its crew of two, but it is somewhat deficient in fire-power. The gunner is located in rear of and higher than the driver.

This tank is chiefly suitable for the close accompanying of foot troops. Although not particularly well suited, tanks of this type could, under favorable circumstances, also be utilized to lead.

The installation of a more powerful power plant and the reduction of the noise of the track and suspension would add to the speed and efficiency of this tank.

The Ford tank is a war-time product of the Ford Motor Company. Fifteen of these tanks had been completed at the time of the Armistice. It is a small, low, light, compact tank, in which the driver and gunner sit side by side. Among its characteristics are:

Length—13 feet, 8 inches;
Weight—6300 lbs.;
Crew—Two men;
Armament—One cal. .30 machine gun;
Maximum speed—8 miles per hour;
Armor—Protects against all cal. .30 weapons;
Power plant—Two four-cylinder engines of the type used in the old Model T automobile, combined H. P.—45;
H. P. per ton—14.3;
Transmission—Two-speed, Ford type, planetary;
Suspension—Steel rollers and springs.

A tank of this type is not likely to be suitable for any tactical employment except close cooperation with foot troops. Its lack of cannon is an inherent weakness. On the other hand, its low, compact design, its ease of concealment, its lightness, and its relative cheapness make the general type worthy of consideration in the light tank field.

The Ford tank, as actually constructed, cannot be seriously considered for the future. With various modifications, however, that would increase its size and weight somewhat, a useful and materially faster tank might be developed. On the other hand, the fact that a very small tank is helpless in the face of relatively minor obstacles is a factor for consideration.

Three pilot models of the 23-ton type have been built by the Ordnance Department since the World War. The last of these, known as the Medium 23-Ton Tank, T1, was completed in 1925. Among its characteristics are:

Length—21 feet, 5 inches;
Weight—23 tons;
Crew—4 men;
Armament—One six-pounder gun and two cal. .30 machine guns;

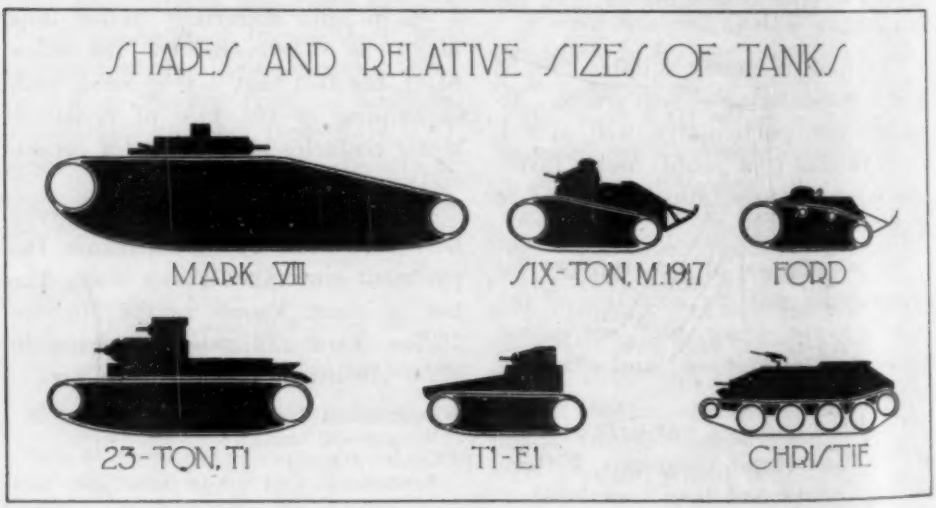
Maximum speed—Approximately 12 miles per hour;
Armor—Protects against cal. .50 machine guns;
Power plant—Packard, 200 H. P., eight-cylinder engine;
H. P. per ton—8.7;
Transmission—Four-speed, epicyclic;
Suspension—Steel rollers and springs.

This type of tank, although possibly somewhat larger than necessary, is very efficient at leading. That is, due to its size, weight, armor, fire-power and reasonable speed, it can smash through hostile resistance and break the way for the main effort of the foot troops. The 23-ton, T1, is, however, underpowered; consequently it is relatively slow. With comparatively slight modifications, and a more powerful engine, its speed could be materially increased, with a material gain in efficiency as a result. This tank has made a very favorable impression on the tank personnel that have come in contact with it. It appears to be efficient and satisfactory to a high degree for the purpose intended.

The light tank, T1-E1, is a recent experimental product of the Ordnance Department and the Cunningham Motor Company of Rochester, N. Y. The first pilot model was completed in 1927. Since then there have been five more of this type built. Of these five, three were finished as combat tanks and two as cross-country cargo carriers. A pilot model T1-E2 was later constructed on the same general pattern in an effort to eliminate a number of defects in the T1-E1. Among the characteristics of the T1-E1, are:

Length—12 feet, 8½ inches;
Weight—7¾ tons;
Crew—Two men;
Armament—One 37-mm. gun (new type) and one cal. .30 machine gun;
Maximum speed—18 miles per hour;
Armor—Only partly protects against cal. .30 A. P. ammunition;
Power plant—Cunningham, 105 H. P., 8-cylinder engine;
H. P. per ton—13.5;
Transmission—Three-speed, sliding gear;
Suspension—Link, without springs.

This tank, at the time of its appearance, was the fastest tank ever built in the United States. In its mechanical reliability as a vehicle, it is a great improvement over the war-time types of tanks. In the T1-E1 the power plant is in front of the crew. In the other tanks mentioned in this article the power plant is in rear. Placing it in



front is held to be a simple and satisfactory arrangement from the mechanical viewpoint. Placing it in rear is claimed to be advantageous from the standpoint of the using service. The T1-E1 is not an easy-riding tank. The exact nature of the improvements that have been effected in the T1-E2 are not known to the writer.

A tank of this speed and type is suitable for accompanying foot troops, and could, under favorable circumstances, be used for leading.

This tank was produced by J. Walter Christie at Rahway, N. J. At various times in 1928 and 1929 it has been used in making demonstrations for and has undergone tests by military agencies. Among its characteristics are:

Length—17 feet;
Weight—8.6 tons (without turret or armament);
Crew—Undetermined;
Armament—Undetermined;

Maximum speeds:
On tracks—Approximately 45 miles per hour,
On wheels—Approximately 70 miles per hour;
Armor—Protects against all cal. .30 weapons;
Power plant—Liberty, 338 H. P., twelve-cylinder engine as designed for airplanes;
H. P. per ton—39.3 (on basis of 8.6 tons weight);
Transmission—Four-speed, sliding gear;
Suspension—Rubber-tired wheels, individually sprung.

As is apparent from the above, the Christie tank is capable of remarkable performances. So far as known, it is the fastest tank in existence. It has all the speed that could possibly be expected or desired. Considering its speed, it is very easy riding. It gives promise of becoming a dependable and highly valuable weapon. The satisfactory way in which the tank travels on the roads with its tracks removed seems to indicate that tank-carrying trucks will not long be regarded as necessary. If perfected and adopted, a tank of this type should be highly suitable for use in an armored force. It could also be used for leading, and if necessary it could cooperate closely with foot troops.

TANK ORGANIZATION

The organization of tank units is necessarily founded upon the type of tank. Our present organizations are accordingly based upon the light tank (Six-Ton, Model 1917) and the heavy tank (Mark VIII). When some other type of tank becomes available in quantity, it will require a slightly different type of organization. Although differing in details, there is a great similarity in the main features of the organizations pertaining to the light and heavy tanks. The following is equally applicable in either case:

1 Tank Regiment (formerly Tank Group):
Hq., Hq. Co. and Band;
3 Tank Battalions;
1 Service Company;
Attached medical.

1 Tank Battalion:
Hq. and Hq. Co. (Hq. Co. includes a Maintenance Plat.);
3 Tank Companies;
Attached Medical;

1 Tank Company:
Headquarters Platoon,
Headquarters Section,
Maintenance Section,
Replacement Section;
3 Tank Platoons.

The outstanding differences between light and heavy tank organizations are:

a. The light tank platoon has five tanks; the heavy has three.

b. Two men constitute the crew of a light tank; one officer and ten men the crew of a heavy tank.

c. A greater number of men are required in the heavy organizations; for example, the total personnel of a light company is one hundred and forty-five, a heavy company, two hundred and sixty-nine.

The light tank company of an infantry division has practically the same organization as the light tank company of a tank battalion, the only difference being that the former has a few additional men and vehicles for maintenance purposes.

Tank units, except the divisional tank companies, are G. H. Q. troops.

The next article of this series next month will deal with the subject: Present Ideas of Tank Tactics.

Morris-Martel Two-Man Tank

On Riot Duty

A page from post World War experience in Germany

A. SPINDLER, late Captain of Cavalry, Royal Prussian Army and Army of the German Republic

RIOT duty is one of the hardest and most thankless tasks that may fall to the lot of a soldier. Nevertheless it is duty that he sometimes has to perform—if other agencies have been unable to handle the situation. He cannot afford to fail. Therefore, the more he knows about this difficult work the better it will be for everybody when the always unfortunate and usually unanticipated need for riot duty arises.

Riot duty is essentially different from war. After all, war is a combat between two groups of men who are real sportsmen, even gentlemen, though they may eat with their knives. A man who has stood the misery of a long, hard fight, who has lived for months on starvation rations, and who has had no company but equally miserable companions and lice—and who has not taken advantage of some trickery to get away from the front line—is a sportsman and a gentleman in the fullest sense of the word. In war you fight side by side with gentlemen against gentlemen.

But riot duty is different. There the soldier usually meets nothing but the dregs of his own people. And, as many do not realize, the work is at least as dangerous as regular warfare.

We read of cruelties in warfare—and those of us who have been there know that they are mostly lies of sensational mongers who dare to use them because their own soldiers stand between themselves and those whom they slander. We do not hear so much of the atrocities that occur when rioters get hold of a soldier or a policeman. It is not quite so healthy to spread the news of them. But the history of Pennsylvania's mounted police leaves no doubt that they occur. In war a soldier runs more chances of being killed or wounded, perhaps, but when he is a prisoner he is safe; in a riot, when a soldier is a prisoner he is in the worst possible fix.

Riot duty is a more than usually thankless task. The rioters are voters and there will always be some politicians to take care of them; the soldier is not a voter, and there are none but his own kind to protect him.

Then there are riots and riots. In some, any self-respecting officer and soldier would rather take a crack on the head than harm the rioters—as when the rioters have a just cause and the armed forces are used against them through improper political influence. Fortunately riots of this kind occur seldom. It is not of them that this paper will treat, but of riots which the military forces may undertake to quell with the knowledge that they represent the right.

This writer has had, very unfortunately, much experience in riot duty. It took us quite a while to find the right way to handle the situation when our old government had broken down and the mobs were trying to apply their own formula of democracy in Germany. It is to offer my American

fellow officers the benefit of our experiences that I write this paper. Many readers may believe that I am unbalanced in considering even the possibility of large scale riot duty. That is what we Germans thought when in 1917 the Russian officers wanted to tell us their experiences. What good could that knowledge do us, we said, in our country with its prosperous and satisfied people? We learned that the only consistent thing with the masses is their inconsistency, and that it takes only a few shrewd leaders when times are hard or when employment is slack to create a real mess. However one may look at it, it is good to be prepared against any eventuality, to have thought things over before they may happen, and so to be able to avoid having to meet facts as helplessly as a cow does a new stable door.

When the mob is on the rampage nothing but armed force stands between conservation and destruction. The police can not handle more than local situations, and even in these they fail if their organization is principally political. Armies do not start upheavals, as they do not stars wars, but they fight both to a successful or a bitter end.

In riots, just as in war, the real soldier will try to achieve the utmost with as few losses as possible. In riots he tries especially to prevent casualties to the other side. The men in the mob are not the real culprits. The men who deserve the penalty are out of the reach of the soldier; while their creatures are fighting, they themselves stay in the government lobbies and in good hotels. They do not risk their own lives. The men whom the soldiers' guns reach are mostly irresponsible tools of the higher-ups. Therefore the soldier should try to quell riots without shedding blood, but if blood has to be shed, let it be just from bloody noses and mouths. The effect is the same as if it were from real wounds.

There are three different groups that are to be distinguished among rioters, and they need three different kinds of treatment. To treat them all alike is to struggle against a compact mass, which can be beaten only with heavy losses. To handle them separately makes the task much easier and results in the restoration of order without bloodshed, court-martial, hungry children whose fathers are in jail, and the other unpleasant consequences of an incorrectly handled riot.

The first group among rioters is "just crowd." It comes together either because incited by agitators or simply through curiosity and herd instinct. You can see this exemplified on any city street. In the crowd are many orderly and even timid people whose presence in such company seems almost incredible.

Left to itself the average crowd is harmless. It disperses by itself in time —when the weather is too hot or too cold or wet, when feet get tired, and when the pressure of the crowd becomes great. With such a crowd it is important not to make a great show of strength. If you do the crowd may remain just to see the spectacle. But if you have a few men stroll through the crowd and try quietly to break it up (though with gun in pocket and hand on gun) not even a newspaper reporter will have the patience to stay around indefinitely.

But if something excites such a crowd it becomes terrible. Men in crowds are just like some animals which are normally timid or even

cowardly, but, which, if they smell blood, must have more blood. Women, and even ladies, who dislike to see even a wounded sparrow do not mind poking the points of their parasols into the eyes of wounded soldiers when the mass craze comes over them. This is true without regard to nationality, religion, or civilization; the individuals are just too weak to resist the madness, and very deeply do they regret their actions when they become responsible again. Therefore it is the first duty of the military leader to avoid having his soldiers killed or wounded before a crowd that he is trying to handle. For the same reason, though less strongly so, it is well not to shed blood among the rioters themselves, and so to avoid stirring up blood madness in the crowd. The effort must be to keep the crowd quiet and to disperse it as soon and as imperceptibly as possible. When dispersed its members become a number of harmless individuals who soon become normal and are glad to get back within their own four walls. Kept together and opposed, the crowd becomes a Moloch that cries for human sacrifice.

The second group among the rioters includes the instigators, the men behind the scenes. The soldier who is not at headquarters seldom comes into personal contact with them. The instigators keep their skins whole and let others do the actual fighting and bleeding for their usually selfish purposes. They are to be found at political meeting places and where life is safe and pleasant, but not among the hard-working population and the men who are willing to fight against what they have been led to believe are their wrongs. Not at all infrequently the real leaders of the riots enjoy immunity on account of high political position. Among these riot instigators who do not mind exposing thousands of heads of families to death there are few who do not whine like whipped curs when they have to risk their own lives. This, too, is a universal truth.

Since destruction of political menaces such as these instigators is difficult, it ordinarily occurs only in extreme cases. But there are other ways to handle them.

A very efficient and amusing way of putting an end to activities of the smaller and middle fry among riot leaders is to compromise them. Though this is chiefly something to be done from headquarters, any officer can contribute toward it. These instigators, being full of mean ideas and intentions, assume the same about other people and do not trust anyone. Therefore, when it is possible for an officer to meet them in public, it is worth his while to do so. He should meet and greet them with apparent cordiality and understanding, or talk confidentially to them, or do anything that he can think of to make others suspect an intimacy. Carefully directed and done, this line of action will go far to destroy harmony among the intermediate riot leaders, each being led to believe that the other is playing a double game—as indeed some begin to do. Therefore, an officer should in general be polite and cordial in his intercourse with riot leaders as long as others are there to see and become suspicious. I personally went so far as to go to the funeral of an important "Red" leader and to follow the coffin. I was conspicuously in uniform and among the worst of my enemies—and so completely disturbed their peace of mind. To be sure, an armored car was never more than a

block away, or I might have stayed right on in that cemetery myself.

The third group of rioters deserves the full attention of the troops. It consists of the intermediaries and liaison men between the instigators, or the brain, and the crowd, or the tools. Its members should be brought to cold storage as soon as possible. Without their work seldom does anything serious happen. Laying hold of them is like cutting the communication wires. It interferes seriously with action. These men are usually loafers, bums, and other bad elements who by natural inclination gather wherever mischief promises. The instigators usually send them into the crowd to stir it up. The agents like this work because there is a chance for picking pockets, looting shops, and other pleasant activities, punishment for which is avoided by an expected general amnesty.

The officer must deal with these men promptly and thoroughly. The natural inclination is to shoot them for the general benefit of mankind. But to do this would make them martyrs and would crown dirty lives with undeserved glory. Further, it would furnish just the opportunity that the riot leaders want for a story of cruelty by the troops. Since these men can't be shot out of hand, they must be gotten hold of. This is difficult, since they stay in the near background, close enough to the troops to be able to provoke them by words, brickbats, or even bullets, but always protected by a few rows in the crowd, women and children preferred. They watch the situation and act if they can do so without risk to themselves—if the officer doesn't know how to handle them and to distinguish between them and the harmless crowd.

"La morte rend sublime, mais le ridicule tue" should be the leading idea in getting at these intermediaries. Here is a way to act. Form small groups of from three to five husky men who have on heavy hobnailed shoes. Without visible weapons have them walk up and down between the line of the troops and the crowd, always drawing a little closer to the crowd until they are able to break through the first few rows and get the men they are after. These patrols do not make mistakes. They always bring the right men back.

Then take the captives into a house and give them a good hiding with a belt so that when you turn them loose they rub the smarting part, and so let the crowd know what has happened. Then see that they get a nose bleed or a cut face and turn them loose. This will further humiliate them and identify them to you for future purposes. After a few days you won't see them any more. In the meantime the crowd will have ridiculed these "brave" men who only a short time ago had been shouting "Let's die for our rights" and other such insincere truck. When this laughter is going on the officer generally has nothing more to do than step forward and call to the crowd that it is time for dinner, or some such thing, and in a few minutes even the last lingerers will have left.

At one time when meat was scarce in Germany, it was in Westphalia during the Red insurrection and terror, a father whose son I had given this treatment brought me a whole ham as a present. When you handle the disturbers in this manner the ordinary elements are usually on your side, but if you shoot they form a dangerous solidarity against you.

Such a whipping is certainly the only right way to treat bullies and young men. With older men the effect would not be the same. The older men usually fall into two categories. One part belongs to the criminal class, and these you do not send back into the crowd but turn over as a very welcome present to the local police. The other part is made up of men who have been for sometime out of work, especially heads of families, who become excited. Let these men first have something to eat and then a cigarette. If the police have nothing against them send them home after having noted their addresses and brought pressure on their former employers to give them work. Though the latter may not enjoy this, it is the least contribution that they can make toward clearing up the situation.

Summed up, the leading idea in handling the third group among the rioters is to interrupt the communication between the instigators and the mass, to punish these liaison bums in a sensible way, and to do what you can to eliminate proper grievances among the rioters.

Of course all of the foregoing is only a part of the task. Even though you do not show your strength, have it ready. It should be impossible for the mob to surprise you. You should be like a cat lying with half-closed eyes, but ready to strike in any direction.

Sometimes when the rioters are experienced they filter their men surreptitiously through the crowd from behind and then attack suddenly. If this happens there is nothing left but to shoot, but not at the first rows, for that would kill the screen of women and children whom the rioters always provide. The target for this shooting should be the real rioters and not the harmless people in the crowd. The people in rear of these men then have a chance to drop back. If it is necessary to shoot into the crowd, aim at the feet to wound, but not to kill. If you take prisoners, treat them like prisoners of war, or even better, and do not take anything except their weapons from them.

The situation is much simpler if the troops are on the ground first and have only to keep a crowd from forming. But whether the crowd or the troops are there first, there is always something to do at once. Send a light machine gun or two to a dominating roof in order to take care of any rioters who may undertake to start things by shooting from houses or house-tops. For these there must be no quarter. If you don't dislodge them, they will kill your best men and turn loose the beast that is in the crowd. In posting these light machine guns, always send several men, so that some of them may be watching in all directions.

One thing that makes a formed crowd hard to handle is the people who are pushing from behind and who make it impossible for those in front to fall back. Orders to fall back, blowing a bugle, or even shooting into the air, does not help. The people in front may want to get away, but cannot. A way to speed things up is to send a detachment of twenty or thirty men to the rear of the crowd. From there they can disperse it quietly and quickly, and often can make valuable catches of instigators or intermediaries, and keep them immobilized for some time.

If the troops are on the ground in advance of the crowd, the principal

thing is not to let the mass form. Here again small groups of three or four men are best, with a good husky man to talk business to young loafers, if necessary by means of fist to jaw. Some of these groups should include experienced younger officers or non-commissioned officers to keep the older people moving by telling them very politely "please, but quickly." A patrol of eight or ten men sent well behind the gathering crowd, if possible led by a secret service man, will usually pick up some of the instigators or intermediaries. These should be brought quietly back to you, and you should shake hands with them, give them a cigarette, tell them how glad you are to have them help you disperse the crowd. Usually they will be glad to get out of it by agreeing with you. Then you invite them courteously but firmly to be your guest as long as there is any chance for trouble, and you give them orderlies to attend them—quick men who have guns in their pockets. Such a system of co-operation works wonders and smooths things out quickly.

Horses also work wonders in keeping a crowd moving. Their hoofs are harder than men's toes—and rioters always have corns. It doesn't make much difference what kind of horse you use, a cavalry mount, a mule from a machine gun cart or a rolling kitchen—they all have hard hoofs. But dismounted patrols should always closely follow the mounted men in order to keep them from being dragged down from their horses and severely handled.

All of the foregoing is work for the soldier who is on the spot. To others situated higher than himself he must leave the handling of the real instigators of the riots. But if he exercises patience, common sense, and moderation, he will have done his task, and that without unnecessary shedding of blood.

Example of the Need for Industrial Mobilization

From the Notebook of "General Experience"

ON the day of the Armistice, of the United States Army's war materiel then in line, France had manufactured one hundred per cent of the seventy-fives, one hundred per cent of the one hundred and fifty-fives, one hundred per cent of the tanks, eighty-one per cent of the airplanes, and seventy-five per cent of the long guns."—*Andre Tardieu.*

Machine Gun Notes, I Corps Area Machine-Gun School

CAPT. HARRY J. COLLINS, Infantry [1]

THE I Corps Area Machine Gun School, composed of all Regular Army machine gun companies of the corps area, completed its third year of summer training on August 19, 1929. During the seven weeks of training the following subjects were covered: review of mechanical training and elementary and advanced gun drill, extended order, direct laying, instruments, indirect laying, sight-and-position defilade, antiaircraft, and combat practice. The units had completed marksmanship before arrival at the school.

The school day was from 7:00 a. m. to 4:00 p. m. The first and last hour of each day were devoted to care of animals, which included an officers' horse-shoeing school, which was fully described in the October number of the INFANTRY JOURNAL.

Training was divided into two phases, one for troops and one for leaders. An effort was made to give the troops only what it was believed they could master and retain. After the third week all training was decentralized as far as possible.

Sufficient copies of The Infantry School Pamphlet 3-11 [2] were received to provide distribution to all officers and noncommissioned officers, and this document was then used in the instruction in direct laying, which was taught to the entire school by conference, demonstration, and practical work. The leader's rule and gunner's rule, using field glasses, were the exceptions to the foregoing, instruction in these two being confined to the school for leaders.

In teaching target designation, the oral designation was discouraged and the leaders were encouraged instead to point out targets by means of the gun or cleaning rods.

Instruction in sight-and-position defilade followed direct laying. It was interesting to note that as soon as these methods were understood the troops invariably used them in direct laying problems and in combat practice.

Upon completion of direct laying a test was held to determine the most proficient company. A roster of the corporals and privates of each company was cut up so that each name appeared on an individual slip. These were placed in an envelope with the company designation on it and a team was then drawn consisting of one corporal and nine privates. The team was then examined at a point one mile from the assembly area. The test covered every phase of direct laying and required nine hours for completion. Company H, 5th Infantry, won the test and was awarded the direct laying pennant.

The value of this type of test lies in the fact that it makes it mandatory that every company commander have

[1] Senior Instructor, I Corps Area Machine Gun School.

[2] Infantry School pamphlets referred to herein are actually revised training regulations which have been tested at The Infantry School and will be submitted as revision to training regulations.

The Chief of Staff Inspects Co. M, 13th Inf., Winners of the "Best Appearing and Equipped Company" Competition at the School

as many men as possible for duty each day, and that the unlikely recruit is not placed permanently on kitchen or stable police. As it actually worked out, the officers and noncommissioned officers in each company finally became instructors for the backward recruits, priming them for the test.

Indirect laying was a subject of the leader's school. This school consisted of officers and selected noncommissioned officers and privates. The single gun and battery map method was taught first in order to teach the principles governing indirect laying. Only two single-gun and four battery problems were solved. The greater part of the time was devoted to TOG, single OP, and traverse method, single gun and battery. The aiming circle, or compass, method was the only one taught. Some organizations had azimuth type range finders. These were replaced by the roller type, artillery range finders drawn from the ordnance officer at Fort Ethan Allen.

While indirect laying was being taught to the leaders, battery drill and extended order were taught to the troops. The battery drill taught was that covered in Infantry School Pamphlet No. 3-23. It was found to be simpler and better than the present drill contained in TR. 420-55. Extended order was taught, using the Infantry School Pamphlet No. 3-34. Great stress was laid on the use of ground and cover.

The examination in indirect laying consisted of a test of selected noncommissioned officers or privates in obtaining, plotting, calculating, and applying the data. Company commanders selected two noncommissioned officers or privates who were members of the leaders' school. These men were issued instruments, shown the targets and battery position, and turned loose to solve and fire the problem. Their problem was a traverse-method battery and consisted of two tasks. When the problem was completed and the battery commander's firing sheet filled in, the latter was turned over to another se-

lected noncommissioned officer or private, who had been taught battery drill in the troop school, and who then laid and fired the battery. The enlisted men who figured the problem witnessed the firing from a dugout.

This type of test created rivalry within each organization. The enlisted men who computed the data warned the remainder of the company that if they applied correctly the data given them, the target would be hit. The company assured the men who figured the data that if their figures were correct the target would be hit. Company H, 5th Infantry, won the indirect laying pennant, with Company M, 13th Infantry running a very close second.

Only a total of fifteen officers and noncommissioned officers could be given the antiaircraft course, on account of the amount of tracer ammunition required. The problem of constructing an antiaircraft range was one of the most difficult that confronted the school, but this was finally solved by constructing a range from salvage material procured at Fort Ethan Allen, and a course was worked up. This course was fully covered in the September number of the INFANTRY JOURNAL. The credit for the good points of this course should go to Maj. L. R. Boyd and Lieut. J. I. Greene of the Department of Experiment of The Infantry School, as it was from them that we obtained all of our antiaircraft information. Following the firing on the antiaircraft range, each company fired on a towed sleeve target. The plane with the target made three flights for each company, towing the sleeve twice at five hundred feet and once at one thousand feet elevation. Upon completion of the firing the antiaircraft pennant was awarded to Company D, 5th Infantry, who won it by a substantial margin. The rules governing the awarding of the pennant allowed forty per cent for the antiaircraft course and sixty per cent for the towed-sleeve firing.

Instruments were taught during direct and indirect laying. The use of the range finder, compass, clinometer, and field glass were taught during direct laying. The aiming circle, sitogoniometer and angle of site instrument were taught during indirect laying. Infantry School Pamphlet No. 3-42 was used as the text.

No competition was held in combat practice. Every effort was used to develop the section leader and the maximum time available was devoted to the section and platoon in attack and defense. This subject ended with a combat practice problem involving all organizations and carrying them from the approach march through deployment, organization and firing of a barrage, the attack involving direct laying problems and the organization of the ground. The problem started at 4:30 p. m. (darkness at 5:30) with the troops actually in the approach march. The problem was a "free" one, and one requirement was the organization of a barrage and the obtaining of data prior to darkness. As it actually worked out the data were plotted, figured, and the batteries laid during darkness. This last step was accomplished by means of aiming circles, using flash lights. The barrage was fired at daybreak the following morning with excellent combat results. Immediately afterwards each organization reverted to battalion control, and the problem was so constructed that the companies were thrown in the fight

after a lapse, in problem time, of four hours. Officers then became umpires and noncommissioned officers took command of companies, platoons, and sections. From this point on, each company was confronted by direct laying problems for the next three hours. They then organized the ground for defense.

The outstanding event of the summer school was the inspection made by General Summerall, and the corps area commander, Gen. Preston Brown. The condition of the school and the appearance of the troops are described by the comment of the Chief of Staff to the effect that he had never seen a finer appearing command. This comment means more than it would indicate on the surface, when it is understood that these troops were in the field, undergoing hard training, having marched from two hundred to two hundred and fifty miles from their stations, and had about two months more field training to undergo.

One of the excellent features of the school was that organizations were judged on their knowledge of technique and the ability of their leaders, and not on marksmanship.

In view of the large yearly turnover of both noncommissioned officers and men, it is believed that more progress can be made by enlarging the "leaders' school," composed of selected noncommissioned officers and privates who plan on remaining in the service, and concentrating on their machine gun education with a view to developing leaders. The remaining troops should be given thorough training in mechanics, drill, extended order, and antiaircraft. The members of this leaders' school could be excused from all guard and fatigue and permitted to devote their entire time to training. Thus, the better men in each organization would be given an opportunity for advancement, and the organization would build up a staff of leaders and instructors that would be in reality the backbone of their companies.

Since tracer ammunition is used in all direct laying, antiaircraft and combat practice firing, its supply is one of the most important problems that confront a machine gun school. The lack of tracers will seriously handicap machine gun training.

Besides the training afforded the personnel, the school was in a position to test out thoroughly the technique as now taught by the machine gun section of The Infantry School. This was found to be logical, simple, and accurate. A need was felt for a simpler "leader's rule," but no one was able to provide one. In antiaircraft firing a need of an antiaircraft sight was manifest to every officer and noncommissioned officer. The Mathews mount, of which the school had four, was given a good test and met with approval.

From experience in teaching indirect laying to selected noncommissioned officers and privates, it is believed that it should not be considered purely an officer's subject, especially TOG.

Next year it is contemplated packing two machine gun companies with the Phillips pack saddle, equipping one or two with the Mathews mounts, and the remainder with the regular issue equipment for all school training and fall maneuvers.

With the school under the personal supervision of and receiving the backing of the corps area commander having the support of the brigade

commander, Brig. Gen. Meriwether Walker, and being under the active command of a machine gun officer, Capt. G. A. Murray, who permits nothing to interfere with training, its success is assured for many moons to come.

The Infantry Pack

From the Notebook of "General Experience"

IT has been an accepted principle that Infantry in heavy marching order should resemble the turtle and carry its shelter on its back. Consequently the Infantry pack has always included some form of light tent and blankets. In addition, extra shoes and other items of various kinds added to the weight.

This procedure has in the past enabled Infantry to operate largely independently of other transport. On the other hand, it has increased the hardships of marches and reduced the mobility to some extent. The necessity for the full pack was the lack of adequate transport.

The development of motor transport in the past two decades, especially cross-country vehicles, raises the question as to whether it is now desirable or necessary to require the Infantryman to carry all of his equipment. Certainly he must carry his weapons and some ammunition. But is it not feasible to eliminate entirely from the pack such items as shelter tent, tent pegs, blankets, and the rest? These items could be packed in squad bags for transportation.

It is obvious that the mobility and morale of soldiers are increased by lessening the weight carried. An opportunity to achieve this result is afforded by the availability of improved methods of transport.

Retrospect

A condensed review for the busy reader[1]

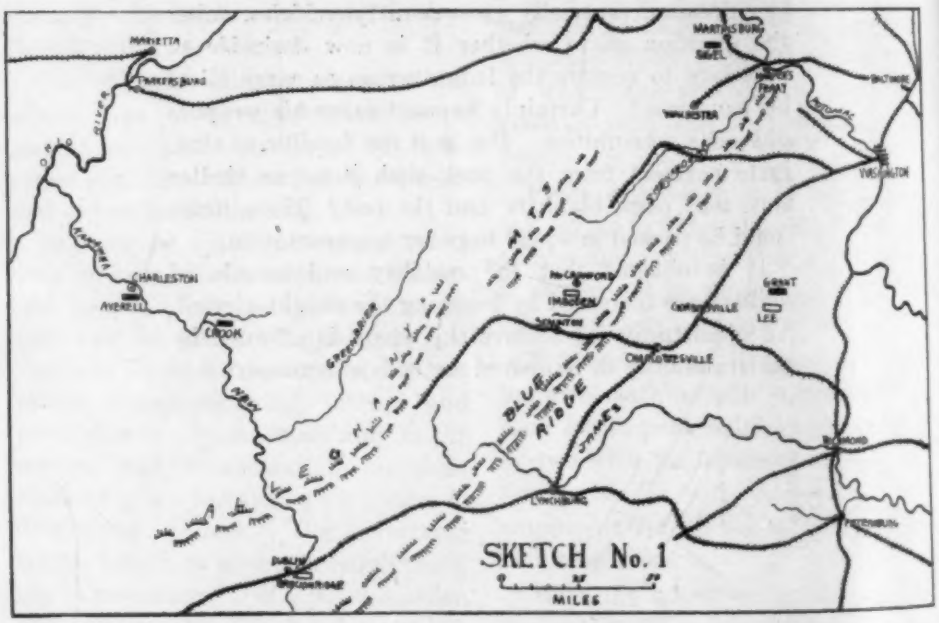
MAJ. FRANK B. JORDAN, Field Artillery

WINCHESTER

WE SHALL now turn our attention to another very important theater of operations, the famous Shenandoah Valley. In his original plan, Grant had designed that movements from both the Shenandoah and the Kanawha Valley would be made in conjunction with his move south from the Rapidan. The whole scheme was planned to rob the Confederates of their advantage of interior lines; obviously the way to do it was to strike from several directions at once. Hence Sigel was to sweep up the Shenandoah Valley, and unite with Crook and Averell at or near Staunton, then the united forces to move on Lynchburg, and thence on to Richmond. At the time the campaign opened, the opposing forces throughout the various theaters in Virginia, West Virginia, and Maryland, were situated generally as shown on Sketch No. 1.

SIGEL'S OPERATIONS

Sigel started up the Shenandoah Valley in accordance with instructions on May 1. On the same day Crook and Averell commenced operations in the Kanawha Valley. At about the same time Lee instructed Breckinridge to take steps to meet these moves, which he had gotten wind of and promptly diagnosed correctly. Imboden's cav-



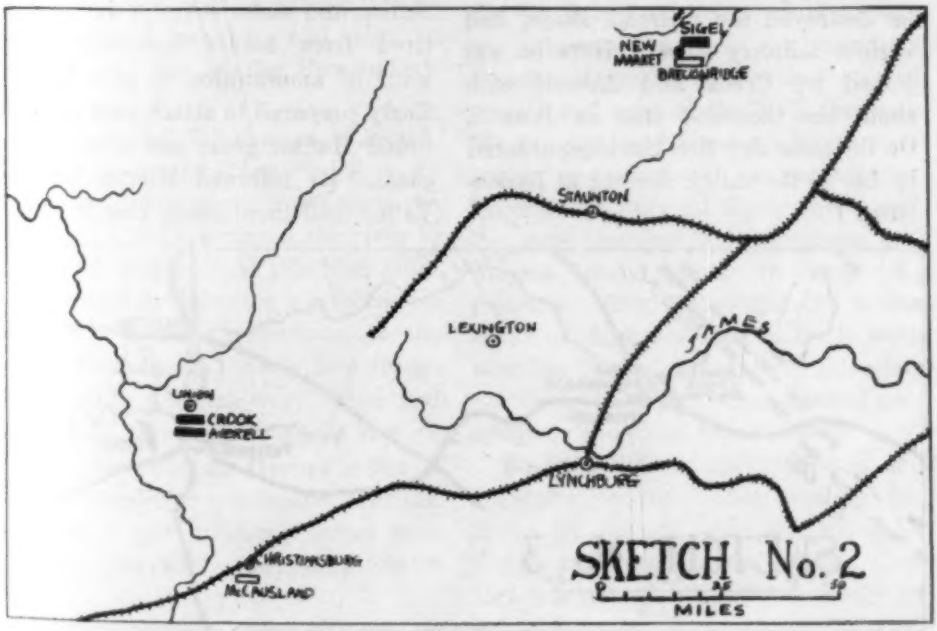
[1] The reader is referred to the introduction to the first article of the series, page 238, INFANTRY JOURNAL for September, 1928.

alry was sent to delay Sigel, and the balance of Breckinridge's forces disposed to resist the invasion from the direction of the Kanawha.

Sigel, with about seven thousand infantry, cavalry and artillery, occupied Winchester, where he remained several days. Crook, with six thousand, moved up the valley of New River, while Averell, with two thousand cavalry, struck directly at the Virginia and Tennessee Railroad in the vicinity of Wytheville. On May 5 Breckinridge started the bulk of his forces north to the assistance of Imboden, who was watching Sigel from the vicinity of Strasburg. W. E. Jones was left with about four thousand cavalry and some reserves and militia to contain Crook and Averell. McCausland's brigade, on its way to join Breckinridge, was also detained until the immediate danger in the southwest should pass.

On May 9 Crook defeated the Confederates at Cloyd's Mountain, and drove them toward the New River Bridge. The next day Averell struck the railroad near Wytheville, and drove off the forces of Jones posted there. McCausland tried to check the Union activities, but was unsuccessful, and was forced to fall back in the direction of Salem. At the same time Sigel moved up the Valley, and Imboden was forced back to New Market. Breckinridge, urged on by Lee, hurried to check Sigel's advance, while McCausland tried in vain to intercept the wandering Averell. On May 15 the opposing forces were situated generally as shown on Sketch No. 2.

Breckinridge met Sigel at New Market on May 15, and defeated him severely. The latter fell back to Strasburg, closely followed by the victorious Confederates. The same day Crook and Averell united at Union, and waited for news of Sigel. Soon hearing of his defeat and withdrawal, they withdrew again to the valley of the Kanawha, arriving at Meadow Bluff on the 19th. Lee, feeling that the



Shenandoah Valley was comparatively safe for awhile, now ordered Breckinridge (less Imboden's brigade) to Hanover Junction to assist him in checking the southward movement of Grant.

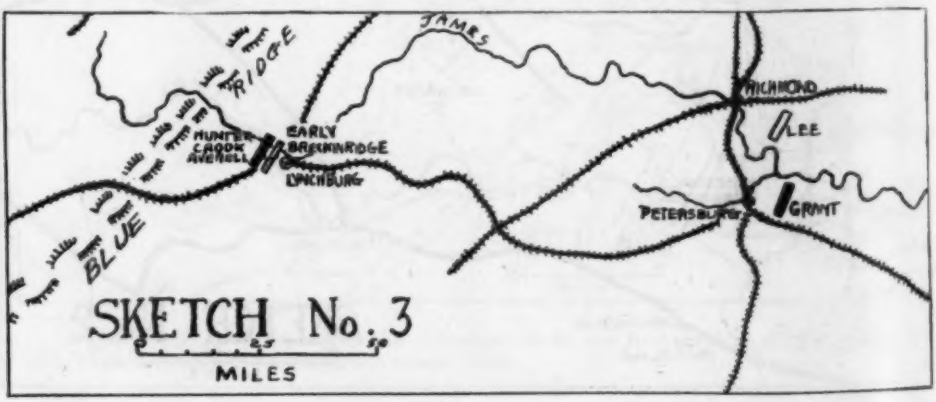
HUNTER'S OPERATIONS

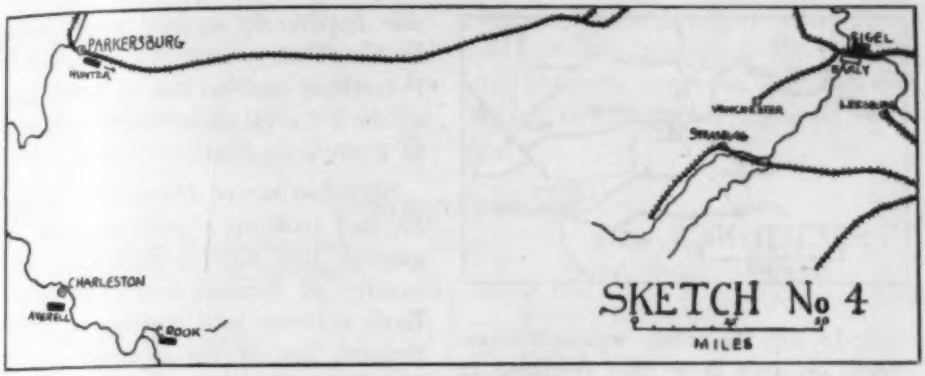
Hunter superseded Sigel on May 21. He was instructed at once to move on Staunton, and break up the branch railroad leading into the Valley, from Charlottesville. On the 26th he moved up the Valley from the vicinity of Strasburg, with Imboden close on his heels. For the next few days his progress was steady, and Jones, at Dublin, was ordered to assist Imboden with all available force. On May 30 Crook started from Meadow Bluff with a view to joining Hunter at Staunton.

Hunter occupied Harrisonburg on June 2, and found the Confederates intrenched at Mt. Crawford. Turning their position via Post Republic, he met and defeated the forces of W. E. Jones at Piedmont on the 5th. From there he pushed on to Staunton, where he destroyed the railroad, shops, and various military stores. Here he was joined by Crook and Averell with about ten thousand men on June 8. On the same day Breckinridge, ordered by Lee to the valley, arrived at Lynchburg.

Hunter started south again on June 10, moving in four columns on Lexington. After a skirmish, the Confederates were driven from the town, and various buildings, including Virginia Military Institute, were burned by the Union troops. Imboden and McCausland fell back toward Lynchburg, where Breckinridge was hastily preparing to meet the invasion. In this crisis, the Confederate government decided to reinforce Breckinridge with veteran troops, and the II Corps under Lieutenant General Early was ordered to the scene.

On June 15 Hunter crossed the Blue Ridge and moved on Lynchburg. He and Early arrived there at about the same time, and skirmished warily on the 17th. At this time the opposing forces were situated generally as shown on Sketch No. 3. The next day Hunter launched a half-hearted attack; the nature of the resistance made it evident that much of Early's corps was already up, so Hunter withdrew from action, and under cover of darkness retired from before Lynchburg "for want of ammunition to give battle." Early prepared to attack next day, but found Hunter gone, and at once gave chase. He followed Hunter into the Valley, and then, seeing that the latter





was moving on into the Kanawha Valley, gave up the chase. Early had other plans, previously concerted with General Lee, and on June 24 started north up the Shenandoah Valley on the last daring invasion of Union territory.

EARLY'S OPERATIONS

Lee's general plan, as outlined to Early, was to force Grant to attack *him*, or to detach so heavily to meet Early's threat that he (Lee) would feel able to take the offensive. A secondary feature was to attract attention to Union territory, and, also, to keep Hunter out of the Shenandoah Valley.

Early reached Winchester on July 2. Pushing on toward Harper's Ferry, he forced the Union troops to evacuate the town and withdraw across the river to Maryland Heights. At this time Hunter was busy transferring his forces via Parkersburg and Cumberland to the scene of action, and Early had things pretty much his own way. Sigel had a scant six thousand to oppose Early's fifteen thousand at Harper's Ferry, so was forced into a defensive attitude. On July 5, the opposing forces were situated generally as shown on Sketch No. 4.

Early wasted no time at Harper's Ferry, but, turning the Union force on Maryland Heights, moved directly on Washington via Frederick. Here, on July 9, he met a force hastily assembled under Lew Wallace, consisting of Rickett's division of the VI Corps and Tyler's brigade of the VIII Corps. After a lively engagement Early drove the Union forces back in the direction of Baltimore, and continued to move toward Washington. He arrived at the fortifications on the evening of July 11, via Rockville and the 7th Street pike, but his men were too exhausted to make an immediate attack. Meanwhile Grant had started the VI and part of the XIX Corps to Washington, and Hunter's forces were beginning to arrive at Harper's Ferry. Throughout July 12 Early threatened the city, causing quartermaster employees and sailors to man the trenches; then he withdrew under cover of darkness after a lively skirmish on Rodes' front. At this time the opposing forces were situated generally as shown on Sketch No. 5.

Early withdrew via Frederick and Leesburg to the Valley, closely followed by Wright with the VI, XIX Corps, and miscellaneous troops. Contact was gained at Snicker's Ferry on

July 18, but the action was indecisive. Again on July 20 a fight occurred at Stephenson's Depot, near Winchester, after which Early withdrew to Strasburg, and Wright started back toward Washington.

On July 24 Early moved up the Valley again, and attacked and defeated Crook at Kernstown. The latter fell back to Bunker Hill, while Early paused in Winchester. From there he pressed Crook back through Martinsburg to Williamsport, and Wright was recalled in haste from Washington. However, it was not a serious invasion; Chambersburg was burned by Confederate cavalry, and various supplies were gathered, and on August 1 Early was concentrated at Bunker Hill, just north of Winchester. A new actor was now to appear on the scene. On August 2 Sheridan was ordered to take general command of all the forces operating against Early.

SHERIDAN'S OPERATIONS

Upon Sheridan's arrival on the scene, he found Hunter concentrating in the vicinity of Harper's Ferry, and the VI Corps at Monocacy Junction. Early was in the vicinity of Bunker Hill, and R. H. Anderson, with Kershaw's division and Fitzhugh Lee's cavalry division, was at Culpeper, in readiness to move into the Valley. Lee was apparently worried about things in the Valley, and the situation at Petersburg enabled him to detach part of the I Corps under R. H. Anderson to Early's support.

Sheridan moved forward on August 10, and took up a position along the general line Clifton-Berryville, with cavalry at Summit and White Post. Early's forces took position along the general line of the Opequon, facing Sheridan. The latter moved forward again on the 11th, but Early withdrew to the south after some minor cavalry action. This same day Lee started Hampton with another division of cavalry to join R. H. Anderson at Culpeper.

Early withdrew to the line of Cedar Creek, closely followed by Sheridan. On August 13, cavalry reconnaissance developed a column moving from Culpeper on Front Royal; it was Anderson coming to the assistance of Early. Sheridan occupied the heights above Strasburg and awaited developments. The next day Grant informed him that Lee had detached reinforcements to Early. On August 16 the Union cavalry at Front Royal was driven in, and Sheridan at once withdrew to the north, reaching Winchester that same afternoon. He continued his withdrawal to the vicinity of Charlestown, closely followed by Early and Anderson.

For the next few weeks no action of any consequence occurred. Cavalry skirmishes and raids, picket fighting and minor warfare filled the calendar. Then Sheridan moved forward again, and on September 3 the two hostile forces again faced each other along the line of the Opequon. Sheridan did not

feel strong enough to attack, and Early, and Anderson apparently did not want to take the offensive. On the 17th Anderson started back to Culpeper with Kershaw's division. The next day Sheridan heard that Early had sent two divisions to Martinsburg, and promptly prepared to attack with a view to beating his opponent in detail.

OPPOSING FORCES

Army of the Shenandoah (Maj. Gen. P. H. Sheridan)	
VI Corps (Wright)	16,400
1st Div. (Russell)	
1st Brig. (Campbell)	
2d Brig. (Upton)	
3d Brig. (Edwards)	
2d Div. (Getty)	
1st Brig. (Wheaton)	
2d Brig. (Warner)	
3d Brig. (Bidwell)	
3d Div. (Ricketts)	
1st Brig. (Emerson)	
2d Brig. (Keifer)	
Arty. Brig. (Tompkins)	
XIX Corps (Emory)	14,600
1st Div. (Dwight)	
1st Brig. (Beal)	
2d Brig. (McMillan)	
3d Brig. (Currie)	
2d Div. (Grover)	
1st Brig. (Birge)	
2d Brig. (Molineux)	
3d Brig. (Sharpe)	
4th Brig. (Shunk)	
Res. Arty. (Taft)	
Army of West Virginia (Crook)	8,600
1st Div. (Thoburn)	
1st Brig. (Wells)	
2d Brig. (Northcott)	
3d Brig. (Harris)	
2d Div. (Duval)	
1st Brig. (Hayes)	
2d Brig. (Johnson)	
Arty. Brig. (DuPont)	
Cavalry (Torbert)	10,700
1st Cav. Div. (Merritt)	
1st Brig. (Custer)	
2d Brig. (Devin)	
Res. Brig. (Lowell)	
2d Cav. Div. (Averell)	
1st Brig. (Schoonmaker)	
2d Brig. (Capehart)	
3d Cav. Div. (Wilson)	
1st Brig. (McIntosh)	
2d Brig. (Chapman)	
Horse Arty. (Livingston)	
Totals	50,300
Guns	112*

* Estimated.

Army of the Valley (Lieut. Gen. J. A. Early)	
Rodes' Div.	4,100
Battle's Brig.	
Grimes' Brig.	
Cook's Brig.	
Cox's Brig.	
Ramseur's Div.	2,600
Pegram's Brig.	
Johnston's Brig.	
Godwin's Brig.	
Gordon's Div.	3,300
Evans' Brig.	
Terry's Brig.	
Hays' Brig.	
Stafford's Brig.	
Breckinridge's Div.	2,800
Wharton's Brig.	
Echols' Brig.	
Smith's Brig.	
Cavalry	
Lomax's Div.	6,200
Imboden's Brig.	
Johnson's Brig.	
McCausland's Brig.	
Jackson's Brig.	
F. Lee's Div.	4,600
Wickham's Brig.	
Rosser's Brig.	
Payne's Brig.	
Artillery (Carter)	2,000
Braxton's Bn.	
McLaughlin's Bn.	
Nelson's Bn.	
Horse Arty.	
Totals	26,200*
Guns	64*

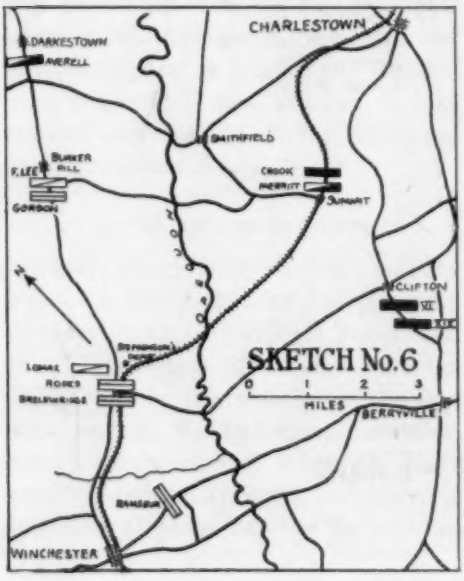
* Estimated.

BATTLE OF WINCHESTER

Sheridan's plan of action was as follows:

Wilson's cavalry division was to move via Berryville pike, force the crossing of the Opequon and seize the defile beyond, formed by the valley of a small stream. The VI and XIX Corps were to follow Wilson and, after clearing the defile, form line of battle and attack toward the town of Winchester. Merritt and Averell were to move from Summit and Darkestown respectively, converging at Stephenson's Depot, and attack the Confederate left and rear. Crook was to be held in reserve. Just before the attack started the opposing forces were situated generally as shown on Sketch No. 6.

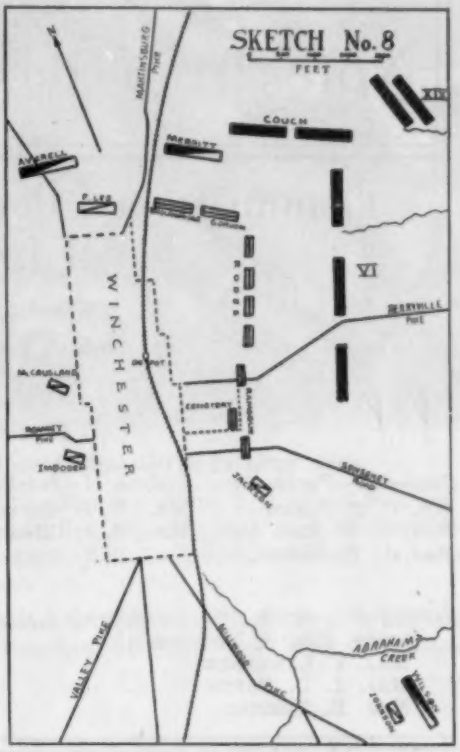
The Union forces moved to the attack at 3:00 a. m. Wilson's cavalry carried the defile with a rush, driving back Ramseur and capturing the earthwork overlooking the Berryville pike. The VI and XIX Corps pushed through behind Wilson and formed line of battle under heavy artillery fire. Crook moved up to the crossing and awaited orders. Merritt and Averell drove back the Confederate troops opposing them, and converged on Stephenson's Depot. At 11:40 a. m. the situation was generally as shown on Sketch No. 7.



Sheridan's main blow was launched with great spirit at 11:40 a. m. The resistance was stubborn; casualties were heavy for the fighting was entirely in the open. Part of the gray line gave way, but a counterattack promptly reestablished it. Crook was put into line to meet a Confederate extension to the north flank, and the fighting grew hot. The Union cavalry now arrived on the Confederate left flank. At about this time Crook launched a vigorous attack against the Confederate left. As the Union cavalry charged home on Early's left rear,

the infantry opposing Crook gave way, and the whole line commenced to fall back. The VI and XIX Corps advanced in conjunction with Crook and the cavalry, and the Confederates were driven back to the outskirts of Winchester. At 5:00 p. m. the positions of the opposing forces were generally as shown on Sketch No. 8.

The resistance of the Confederates in their last position was finally broken by repeated cavalry charges, in conjunction with the infantry advance all along the line. Closely pressed by Sheridan, Early retired through the town. The Confederates reformed just south of town, where night put an end to the battle. Though the forces engaged were not of the size we have been dealing with in the main Virginia theater, the list of casualties given below shows that they lacked nothing in fighting qualities:



CASUALTIES

Union				*Confederate*			
Unit	*K & W*	*M*	*Total*	*Unit*	*K & W*	*M*	*Total*
Campbell	84	9	93	Rodes	686		
Upton	185	—	185			Not reported by units	
Edwards	243	—	243				
Wheaton	167	8	175				
Warner	245	10	255	Ramseur	327		
Bidwell	127	2	129				
Emerson	248	4	252				
Keifer	335	13	348	Gordon	396		
Beal	348	—	348				
McMillan	192	2	194				
Birge	456	69	525				
Molineux	420	87	507				
Sharpe	261	17	278	Breckinridge	217		
Shunk	178	31	209				
Wells	227	—	227				
Harris	232	6	238				
Hayes	134	1	135	Cavalry	348		
Johnson	191	—	191				
Cavalry	372	79	451				
Artillery	35	—	35	Artillery	81		
Totals	4680	338	5018	Totals	2055	1818	3873

Notes from the Chief of Infantry

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Chief of Infantry

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MAJ. C. H. BONESTEEL
CAPT. W. G. LAYMAN

Section IV—Arms and Equipment
LIEUT. COL. E. BUTCHER
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MAJ. H. TERRELL

Section V—Mobilization and Organization
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Infantry Wins National Team Match

THE Infantry Team, shooting in competition with one hundred and seven other teams, won the National Team Match at Camp Perry, Ohio, on September 14, 1929. The coveted National Trophy again comes into possession of the Infantry.

The roll of honor and the part that each member played appear in the following table:

Cheynoweth, B. G., Maj., Team Captain.
Tupper, J. L., Capt., 24th Inf., Team Coach.

	200S	200R	300R	600S	1000S	Total
Berry, K. L., Capt., DOL	43	49	46	48	92	278
Umberger, C. L., Cpl., 23d Inf.	46	50	45	44	90	275
Risner, C., Cpl., 10th Inf.	42	48	47	49	91	277
Stofko, J., 1st Sgt., 30th Inf.	44	49	47	48	89	277
Gailbreath, T. B., 2d Lieut., 29th Inf.	41	47	47	48	94	277
Moore, M. L., Cpl., 4th Inf.	46	47	48	48	93	282
Carlson, J., Sgt., 4th Inf.	45	48	46	47	92	278
Bradford, S., Sgt., 24th Inf.	44	48	41	46	93	272
Lyons, J. P., Capt., 24th Inf.	45	49	43	47	92	276
Bissenden, W. F., Sgt., 10th Inf.	46	50	48	49	90	283
Total	442	485	458	474	916	2775

Alternates: Gunn, Damon M., 1st Lieut., 17th Inf.
Hicks, Herchell F., Cpl., 29th Inf.

The Champion Rifle Team of the United States—The Infantry Team

Lower Row (left to right): Corp. H. F. Hicks, 29th Inf.; Capt. J. P. Lyons, 24th Inf.; Capt. K. L. Berry, Inf.; Capt. J. L. Tupper, 24th Inf. (Coach); Maj. B. G. Cheynoweth, Inf. (Captain); Sgt. J. Carlson, 4th Inf.; 2nd Lieut. T. B. Gailbreath, 29th Inf.; 1st Lieut. D. M. Gunn, 17th Inf.; 1st Sgt. J. Stofko, 30th Inf.

Upper Row (left to right): Sgt. W. F. Bissenden, 10th Inf.; Corp. W. S. Wills, 29th Inf.; Corp. M. L. Moore, 4th Inf.; Sgt. S. Bradford, 24th Inf.; Corp. C. L. Umberger, 23rd Inf.; Corp. C. Risner, 10th Inf.

The Infantry Team shot steadily throughout the match. At the completion of each stage it stood either first or second. At one thousand yards it clearly demonstrated its superiority by pushing forward to lead the nearest competitor by twenty-three points. The following table shows the scores and the standing of the five highest teams at different periods of the match:

	200S	200R	300R	600S	1000S
Infantry	442 (2)	927 (1)	1385 (2)	1859 (2–3)	2775 (1)
Engineers	438 (3)	916 (3)	1381 (3)	1859 (2–3)	2752 (2)
Marines	434 (5)	909 (4)	1370 (4)	1847 (4)	2741 (3)
Coast Guard	437 (4)	907 (5)	1366 (5)	1828 (5)	2709 (4)
Navy	448 (1)	924 (2)	1398 (1)	1866 (1)	2698 (5)

In preparation for the match, the team captain was insistent on mastery of the fundamental principles of shooting. The schedules of instruction provided for frequent periods of so-called "dry shooting." The principles of shooting as outlined in Rifle Marksmanship were strictly observed. This mastery of fundamentals, always important in shooting, is vital for competition, especially in view of the intense nervous strain when shooting as a member of a team. By its victory the Infantry Team has again demonstrated that success in all Infantry training results from a thorough mastery of basic and fundamental principles. As training advances, it is frequently necessary to return to the fundamentals in order that they may be kept in mind at all times.

The victory of 1929 is the seventh

since 1903 (the year the National Matches started) for the Infantry. It won in 1906, 1908, 1910, 1915, 1920, 1927, and 1929. Besides the seven firsts in these twenty-two matches, the Infantry has placed second five times, third four times, fourth twice, seventh once, eighth twice, and seventeenth once (in 1918). An enviable record!

The Chief of Infantry, while observing the matches, received a number of comments from prominent members of other Services on the fine sportsmanship of the Infantry Team. The high regard in which the Infantry Team was held by all contestants was noticeable. The team captain and the members of the Infantry Team are to be congratulated for winning the confidence and good-will of the entire personnel that had a part in the national matches. Utmost endeavor toward success, impeccable sportsmanship, and being equally great in victory or defeat are the essence of the Spirit of the Infantry. The Infantry is proud of its representation in the national matches.

The Chief of Infantry has congratulated, personally, each member of the team, the alternates, and the members of the squad for the parts that they had in the development of the winning team. There are others to whom great credit is due for the development of the team. Regimental commanders cooperated closely in selecting and training candidates in the regiments, and they assisted financially. The authorities at the Infantry School were generous in providing facilities and personnel in the early training of the nucleus of the Infantry Team. The personnel at the Erie Ordnance Depot was active in providing for the comforts of the team during the training period at Camp Perry. The authorities of the National Guard of Ohio permitted the use of the facilities at Camp Perry. To all these belongs a share of the credit for the development of the Infantry Team. The Chief of Infantry desires to express his appreciation for the valuable assistance, able cooperation, and kindnesses shown by all during the practice periods that led up to the national matches.

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Reorganization of the Infantry Battalion

STUDY and experiment in connection with the reorganization project have been under way at the Infantry School since early in August. At this writing conclusions resulting from this study and experiment are not available, but it is expected that the work with experimental organizations will have been completed prior to publication of this JOURNAL. The report of the Infantry Board is expected by December 1, 1929.

The Chief of Staff and the Chief of Infantry visited the Infantry School during September and witnessed the activities connected with the reorgan-

ization project. During these visits experiments were going on with a battalion organization of three rifle companies, two machine gun companies, and a headquarters company. The rifle companies were composed of three platoons, each of two sections of three squads of six rifle and two automatic riflemen. The machine gun companies were each composed of four platoons. One company had three caliber .30 platoons and one of four caliber .50 machine guns; the other company had the three caliber .30 platoons and two 37-mm. guns and two 75-mm. howitzers in the fourth platoon. The caliber .30 machine gun platoons each had four squads of ten men and one machine gun.

In addition to the foregoing battalion organization, there have been experiments with battalions of four rifle and one machine gun companies; two rifle and two machine gun companies; and three rifle and one machine gun companies. In all of these type organizations there was a headquarters company. The howitzer platoon was assigned to the headquarters company except in the experiments in which the battalion had two machine gun companies. In the latter organization the howitzer platoon became the fourth platoon of one of the machine gun companies.

The organization of the interior units of the battalion have likewise been experimented with, as to both size and composition. Rifle companies composed of three, four, and five platoons of varying strength and composition were tried out. In some experiments the automatic rifles were eliminated from squads and organized into a separate platoon. In others automatic rifles were organized into separate platoons in addition to the automatic rifles in squads. Again all platoons were of the same composition with the automatic rifles in the squads. Simultaneous tests were held with a variety of types of machine gun companies and howitzer platoons.

A very thorough investigation into the merits of different types of rifle squads preceded the above tests. In addition to testing squads of different sizes, a variety of combination of weapons in the eight-man squad was used. Firing tests were conducted to determine the relative fire-power of such type eight-man squads as follows: eight rifles; seven rifles, and one automatic rifle; six rifles and two automatic rifles; four automatic rifles and four pistols; eight pistols and one machine gun. The tests included firing in offensive and defensive situations.

As previously stated, it is too early to predict the composition of the battalion that will be recommended. The interrelation between the composition and size of all the units that make up the battalion must be considered before final decision can be reached as to the best type of unit.

In the final analysis, the purpose of the study and experiment on this project is to find that happy combination of fire units of maximum fire-power (using additional existing automatic weapons) which, after satisfying such considerations as mobility, vulnerability, tactical employment, formation, organization, administration, and supply, will produce the most powerful battalion fighting unit.

Armor-Piercing 37-MM. Ammunition

A RECENT test of newly developed armor-piercing ammunition by the Infantry Board, although inconclusive because of the limited amount of ammunition available, demonstrated that considerable progress has been made in developing ammunition for use against tanks.

The Ordnance Department has been experimenting for some time to develop a satisfactory armor-piercing ammunition for the 37-mm. gun. Though this problem has been a difficult one because of the small size of the 37-mm. shell, there has been considerable progress.

About twenty-five of the latest type armor-piercing shells were sent for test to the Infantry Board. These shells were not loaded with the high explosive content, for the test was to determine their armor-piercing ability.

The tests consisted of firing at seven hundred yards against obsolete French Renault tanks, which have armor six-tenths of an inch thick. Nineteen of the hits were identified as armor-piercing. Of these, seven were considered disabling hits and three more would have been disabling if the shells had had their high explosive content.

As a result of the firing, it was tentatively concluded that under the conditions that obtained during the tests a tank can be disabled by an inert armor-piercing 37-mm. projectile; that, of the hits obtained, about thirty-seven per cent will be disabling; and that with high explosive armor-piercing shells about fifty per cent will disable the armored vehicle.

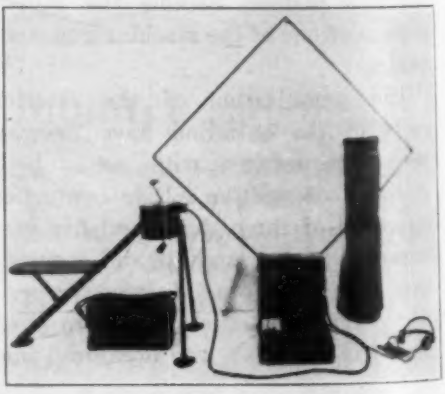
It was recommended that further ammunition be supplied, both inert and high explosive, for a more extended test to show the relative values of the two types of ammunition.

(I)

Radio Set SCR-131 Recommended to Replace Existing Radio Equipment in Infantry

AN experimental radio transmitter and receiver, type SCR-131, having demonstrated superiority over our present radio equipment in an extended test at the Infantry School, has been recommended for adoption as standard to replace radio sets, SCR-77-B and SCR-79-A, in both Infantry regimental and brigade sets.

The SCR-131 set is a loop, continuous wave, telegraph receiving and transmitting set. It has a frequency band of 3,960 to 4,360 kilocycles. This range gives a lap on the lower end of



The SCR-131 Radio Set, Showing Relative Dimensions and Complete Equipment

40 kilocycles with the Air Corps' new set, thus allowing direct communication between Infantry and observation plane. The set is capable of operating over a maximum distance of five miles and can be transported by two men. It can be easily and quickly erected for operation. Power for the transmitter tube and plate circuit is obtained from a hand generator.

An extended test of four SCR-131 radio sets was made jointly by the Academic Department, Infantry School, and the Headquarters Company, 29th Infantry, under the supervision of the Infantry Board. The tests showed that the experimental sets were remarkably sturdy, simple and dependable, and better suited to combat use than the present standard type. The operators very quickly learned to use these sets and, once having used them, were reluctant to go back to our present standard sets. During the tests several defects were found, but all were believed easy of correction.

(I)

Gunner's Pouch for Trench Mortar

THE Chief of Infantry has recently recommended that a gunner's pouch for the 3-inch trench mortar be developed for test by the Infantry Board.

Investigation of a recent recommendation calling for such a pouch developed the fact that, although paragraphs 29 and 97, Training Regulations 420-75, mentioned this article, none had ever been manufactured or issued.

The Infantry Board reports that certain tools, such as tommy bar, combination wrench, extra base cap, and firing pin are required for the trench mortar; and concluded a requirement existed for a pouch for these tools.

(I)

Machine Gun Targets

IN answer to a recent informal inquiry received in the Office of the Chief of Infantry, asking whether machine gun targets "A," "B," "C," "D," "E," and "F" would soon be issued in place of machine gun target Number 1, the reply was made that the new stocks will not be issued until existing stocks of machine gun target Number 1 are exhausted.

When the decision was made to print and issue machine gun targets "A," "B," "C," "D," "E," and "F," in lieu of requiring troops to make these targets from machine gun target Number 1, it was announced that the new targets would not be issued until existing stocks of machine gun target Number 1 were used up. This decision was reaffirmed by the Adjutant General in August, 1929. There are approximately a million and a quarter of these targets on hand.

It is understood informally that a

number of machine gun organizations, rather than modify machine gun target Number 1, are drawing by hand, or are having printed at their own expense, targets "A," "B," "C," "D," "E," and "F." Such practice will indefinitely delay the issue of the printed targets.

(I)

Raincoats

BASED on the conclusions of the Infantry Board after an eighteen months' test, the Chief of Infantry has recommended the adoption of a new raincoat of the Alligator type.

The material of the new raincoat is a cotton cloth impregnated with rainproofing solution. It resembles the familiar Alligator type. The part of the raincoat above the second button of the uniform coat is of double thickness, as are both sleeves. The turndown collar is from three and a half to four inches wide. The design in general resembles that of the present issue raincoat. The front is provided with a double set of buttons and flaps to insure closing. The coat has no belt.

The test showed that the new raincoat was vastly superior to the present coat in weight, in compactness when folded, and in water-shedding qualities. It was found to be less resistant to tears from jagged objects. Two hundred of the new type raincoats were subjected to an eighteen months' test under the supervision of the Infantry Board. Besides the test of wear over this extended period, a number of special tests to determine the comparative qualities of the new and the old raincoat were held. These were: subjecting material to water under pressure; immersion, weighing when dry and when wet; folding for compactness; and storage over an extended period.

The test showed that the new raincoats in general appearance, style, and proportions compared favorably with the present issue raincoat. The new coat is slightly more than half as heavy and half as bulky as the present raincoat. When wet the new coat is just one-half as heavy. The lighter weight of the new coat reduces the weight of full-field equipment by from two pounds (dry) to three pounds (wet). The water-shedding ability of the new coat was superior to that of the old. The new raincoat can be neatly folded much more compactly than the present issue coat; and its volume is about half that of the present raincoat in the make-up of the full-field packs. The coats tested did not crack, stick when folded, or have an objectionable odor. The new raincoat was found to tear much more readily than the issue coat when caught on a snag.

Several minor modifications of the coat, such as increased length, more permanent color, and reinforcement at the waist to provide for greater durability, were recommended.

(I)

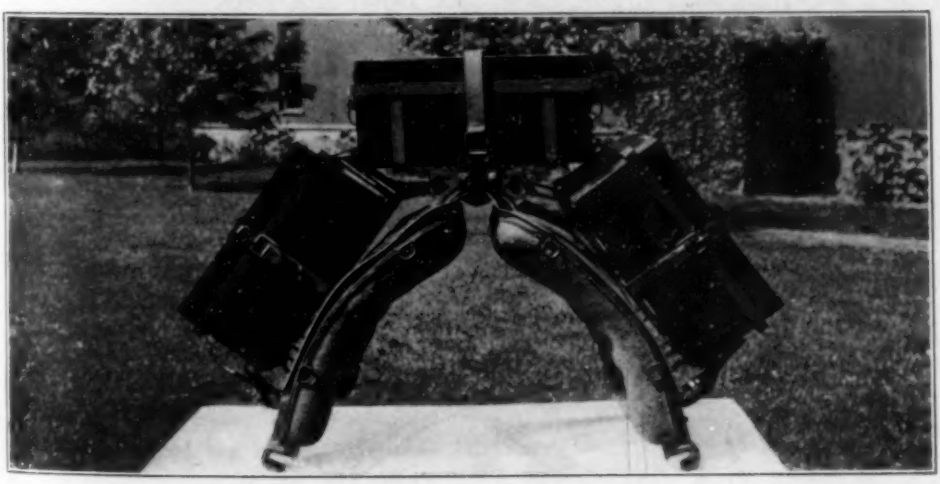
Pack Cooking Outfits

THE cavalry cooking pack outfits will be tested in Panama and the Philippine Islands for use by the Infantry.

The accompanying cuts show the full cooking pack carried by special hangers on the Phillips pack saddle. The outfit is divided into three units. The three units will cook for an organization of one hundred and eighty men. With the pack saddle they weigh two hundred and ninty-two pounds. Each unit is complete in itself. This provides for sending a unit off with detachments. For organizations less than one hundred and eighty strength, the number of units carried will be appropriate to the strength.

Three Cooking Units

The Two Boilers at the Right Are Resting on the Side Hangers of the Saddle



The Phillips Pack Saddle

Cargo Type with Three Cooking Units

Qualification with Infantry Arms

The following additional reports of practice with Infantry weapons have been received in the Office of the Chief of Infantry:

RIFLE MARKSMANSHIP

Inf. Regt.	1 No. of men on rolls required to fire	2 No. of men who completed the course	3 Pct. who completed the course based on 1	4 Number of men who qualified Exp	SS	MM	TOT	5 Average score per man	6 Pct. qualified based on No. who completed the course
5	570	549	96.32	120	189	235	544	289.52	99.09
20	610	560	91.80	28	93	378	499	267.20	89.11
27	756	625	82.67	28	120	404	552	265.15	88.32
31	918	716	77.99	76	164	420	660	276.03	92.18
34	406	395	97.29	31	87	248	366	272.82	92.66
45	861	783	90.94	158	291	330	779	289.92	99.49

Published in August, 1929, INFANTRY JOURNAL: 8th Infantry, 96.97%; 11th, 91.49%; 15th (1st Bn.), 91.96%; 35th, 91.26%; and 57th, 98.89%.

MACHINE GUN MARKSMANSHIP

Inf. Regt.	1 No. of men on rolls required to fire	2 No. of men who completed the course	3 Pct. who completed the course based on 1	4 Number of men who qualified Exp	1Cl	2Cl	TOT	5 Average score per man	6 Pct. qualified based on No. who completed the course
5	190	178	93.68	17	50	111	178	312.49	100.00
13	186	169	90.86	2	13	144	159	275.95	94.08
20	172	154	89.53	10	37	106	153	311.60	99.35
31	214	181	84.58	4	63	114	181	312.83	100.00
34	124	121	97.58	0	11	110	121	285.46	100.00
45	217	212	97.69	31	80	101	212	328.38	100.00

Published in August, 1929, INFANTRY JOURNAL: 8th Infantry, 100%; 15th (Co. "D"), 100%; 22d, 98.19%; 27th, 100%; 35th, 100%; 57th, 100%.

37-MM. AND 3-INCH T. M. MARKSMANSHIP

5	16	16	100.00	8	5	3	16		100.00
20	16	16	100.00	4	11	1	16		100.00
27	19	17	89.47	3	8	6	17		100.00
31	18	18	100.00	8	10	0	18		100.00
34	16	16	100.00	3	11	2	16		100.00
45	19	19	100.00	3	12	4	19		100.00

Published in August, 1929, INFANTRY JOURNAL: 8th Infantry, 100%; 11th, 100%; 22d, 100%; 35th, 100%; 57th, 100%.

Editorial

A Fable

IT IS told that in the region of the Great Khan (Allah preserve his memory!) one Mustapha was a spearman in the army of Ni-twit Pasha. This Mustapha had been a man of the hills before he volunteered as a soldier in consequence of pressure exerted by a recruiting party on a rope. Such an obscure individual would doubtless have lived and died unknown had it not pleased Allah to arrange that he imbibe somewhat too freely of fermented camel's milk.

So for a brief time Mustapha's spirit was back on his native hills hunting the mountain goat and placing snares for the wild pig. And when he awoke, an idea struggled in his sluggish brain. A bent sapling, a noose looped under a forked stick, a pig rooting in the leaves, the noose slips, the sapling jerks the pig high in the air. Why not a bent sapling to throw a spear? But how? No trees in the plains, loose branch with noose at both ends, branch bent and held by cord stretched between ends, will it work?

Mustapha tried his idea. It actually worked, and behold, the bow was born. With visions of a rich regard, Mustapha carried his bow to the tent of Ni-twit Pasha and eagerly he demonstrated its use. Ni-twit Pasha stroked his beard and remarked, "This thing is new, therefore it cannot be good."

And as time passed Mustapha's bow gathered dust in a corner of Ni-twit Pasha's tent, where it had been flung aside. One day the Pasha spied the bow and idly began to play with it. At his first trial he transfixed the sentinel in front of his tent. This so pleased the Pasha that he ordered his vizier to prepare a large number of these weapons and have men trained in their use. This was done.

In the next campaign, the bowmen of the army caused such havoc that the enemy fled in great disorder. The Great Kahn (may his shadow never grow less!) was delighted and heaped much honor and largess on Ni-twit Pasha. As for Mustapha, nothing further is known.

Moral.—If you have an idea that you think is for the good of the Infantry and the Army, send it to the INFANTRY JOURNAL.

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The Contents of The Infantry Journal

AS a matter of general information, and also for the benefit of prospective contributors to the INFANTRY JOURNAL, we publish the following notes on the contents of the JOURNAL:

1. The JOURNAL gives preference to

manuscripts which further the purpose set forth in Article 3 of the Constitution (printed in full on page 441), which are written in good expository form, and which deal with subjects of which the authors have up-to-date and first-hand knowledge.

2. The JOURNAL needs historical articles, but they should be more than mere recitals of fact. The facts themselves should be accurate, but more important, they should be set down with some definite purpose, conclusion, or lesson.

3. The JOURNAL tries to maintain a reasonable balance between articles of a general and those of a technical nature. It needs both.

4. The JOURNAL prefers articles that do not exceed 3,000 words in length. It is our belief that readers of the JOURNAL prefer and give more attention to short articles that are clearly and concisely written than to articles that, no matter what their other excellence, are long, rambling, and difficult to read.

5. Manuscripts submitted for publication in the JOURNAL should be addressed to the editor. The copy should be neatly *typed, double-spaced.*

6. The JOURNAL is glad to compensate authors within the limits of its means. It is also glad to receive manuscripts as gifts.

7. The JOURNAL is glad to receive correspondence about published articles or about other matters of general interest. If the correspondents so desire, and if any good purpose is to be served, it will publish what they write in the Reviews and Discussions department.

Army Pay in 1785

From the Notebook of "General Experience"

THE United States Army consisted of only one regiment in 1785. Its rate of pay shows in a striking manner the economic conditions before the cost of living began to soar.

PAY ON ACTIVE DUTY

Lieutenant Colonel Commandant	$50.00	$42.00
Major	45.00	32.00
Captain	35.00	12.00
Lieutenant	26.00	8.00
Ensign	20.00	8.00
Surgeon	45.00	22.00
Surgeon's Mate	30.00	
Sergeant	6.00	
Corporal	5.00	
Musician	5.00	
Private	4.00	

The adjutant, quartermaster, and paymaster each received $10.00 extra per month.

We wonder if, under the cost of living conditions of 1785, even these small amounts did not make the members of the Army financially better off than we are now.

Reviews and Discussion

The Battle of the Little Big Horn

SOME FURTHER REMARKS BY THE AUTHOR

CAPT. JAMES P. MURPHY, Infantry, D. O. L.

LIEUTENANT SOLOMON in commenting upon my review of the Little Big Horn Campaign in the August number of the INFANTRY JOURNAL, disagrees with me on several points. A brief explanation of conditions under which my review, which appeared in the June number of the INFANTRY JOURNAL, was prepared would not be amiss before answering Lieutenant Solomon's criticism.

The story of Custer's last battle was drawn from my monograph on that subject prepared at the Infantry School, a work which comprised over 18,000 words and was the result of over three months' intensive research in more than seventy-five books and articles written on the campaign. The article for the JOURNAL was necessarily condensed and reduced to about 3,000 words, with the inevitable result that much explanatory matter was omitted.

It is difficult to analyze Lieutenant Solomon's criticism of the statement that "Custer's initial orders to Reno indicated that support would follow." Had a plan for the attack been announced by Custer or even discussed by Reno, Custer, and Benteen, it might be presumed that Reno would properly have expected supporting action by Custer's battalion to take the form of a demonstration in force against the flank or rear of the Indian village while Reno delivered the main effort, as he was initially directed. Further, he might properly have expected some assistance from Benteen, who had previously moved to the left flank, but Benteen's whereabouts at this phase of the attack were not known to either Custer or Reno. It has too often been assumed that Custer had definitely planned to employ an enveloping attack at the Little Big Horn, similar to that which had been so successful against Black Kettle at the Battle of the Washita several years previous. This presumption has never been supported by sufficient reliable source data to merit consideration.

The fact that Custer failed to announce or discuss a definite plan of attack with his battalion commanders is substantiated by the following extracts of testimony before the Reno Board of Inquiry[1]:

Testimony of Captain Benteen: . . . When I received my orders from Custer to separate myself from the command, I had no instructions to unite with Reno or anyone else. There was no plan at all . . . In General Custer's mind there was a belief that there were no Indians and no village. I do not know, except that I was sent off to hunt up some Indians. I was to

[1] "The Story of the Little Big Horn," by Col. W. A. Graham, U. S. A.

pitch into them and let him know. And if I had found them, the distance would have been so great that we would have been wiped out before he could get to us.

Testimony of Major Reno: . . . There was no plan communicated to us, if one existed; the subordinate commanders did not know of it . . . When I say that no plan was communicated to us, I mean to the regiment. I do not think there was any plan.

In the absence of any definite plan and upon receipt of the following order, "General Custer directs that you take as fast a gait as you deem prudent and charge afterwards, *and you will be supported by the whole outfit,*"[2] what other reasonable presumption, except Custer would directly support his attack, might Reno have made?

That there existed no definite plan for a subsequent uniting of the three battalions is a fact further supported by the testimony of Lieutenant Wallace at the Reno Board of Inquiry:[3]

Testimony of Lieutenant Wallace: When we [Reno's battalion] crossed, Custer must have been to our right and rear, Benteen to our left and rear, but we knew nothing as to his orders and expected no assistance from him. I supposed from what Lieutenant Cooke [Custer's Adjutant] said that our support would come from Custer, not Benteen. There was no announcement made to Reno as to junction with Benteen that I know of. There was no plan for the reuniting of the three battalions that I ever heard of.

It has been definitely established that Custer did not support Reno either directly or indirectly, for Custer did not engage any part of the Indian force until Reno had reached the bluffs above the Little Big Horn after his retreat from the flats below. What Custer contemplated will probably never be known. His failure to communicate any definite plan to his subordinates, or even to indicate any other form of support was not sufficient to insure the success of the main effort, which Custer undoubtedly intended that Reno should deliver.

My review takes no exception to Custer's tactics prior to the Battle of the Little Big Horn. They were apparently sound at the Washita, for he was successful in that battle. In that short fight he did not violate any of the principles of war, with the possible exception of the detachment of a small part of his command, which was wiped out. He made maximum use of the principle of surprise, which he neglected on the afternoon of June 25, 1876. Granted that he faced Indians of a more "warlike spirit" at the Little Big Horn, that fact does not excuse his failure to make a definite tactical disposition of his force before launching the attack.

It is questionable whether the loss of a box of hard bread by Custer's column on the night of June 24, and its subsequent "discovery" on the following morning, surrounded by a few hungry "hostiles" influenced in any manner Custer's decision to attack the Indian village (though he did not then know even the approximate location of the village) prior to the arrival of Gibbon's column under General Terry. Colonel Graham's "Story of the Little Big Horn," from which source Lieutenant Solomon has apparently gleaned most of the data to support his criticism, contains the following state-

[2] Italics are the author's.
[3] "The Story of the Little Big Horn," by Col. W. A. Graham, U. S. A.

ment about the Indians who were examining the box of hard bread when Sergeant Curtis arrived on the scene: "The Indians upon sighting the sergeant, at once rode toward the valley."

Testimony of Captain Myles Moylan, regarding this event, before the Reno Board of Inquiry is as follows:[4]

On the 25th at 10:30 to 11:00 o'clock, the command halted. There was a fresh trail visible, only a day or two old. While at this halt at the foot of the divide between the Little Big Horn and the Rosebud, a sergeant of one of the companies returned on the trail to recover some clothing of his that had been lost from a pack mule the night before. He had gone back several miles and while going over a knoll, saw two or three Indians four or five hundred yards in front of him, sitting on a box of hard bread and examining the contents of a bag. He returned at once and reported it to Captain Yates, his company commander. Captain Yates talked it over with Captain Keogh and Keogh hunted up Colonel Cooke [Lieutenant Cooke, Custer's Adjutant] to notify him in order that General Custer might be informed. *General Custer was at that time some distance ahead at the point where the Indian Ponies were visible.*"[2]

Thus we see that no mention is made in Captain Moylan's testimony that the sergeant reported the departure of the "hostiles" toward the village on the Little Big Horn to his company commander. Nor is it in any manner definitely established that Custer was notified of this incident prior to his decision to march on the village in daylight.

It is interesting to note at this point that Indian testimony, which for obvious reasons I ignored in the preparation of the review, states that the Indians discovered by Sergeant Curtis and those observed by Custer prior to the attack were in fact Agency Indians returning to their reservations after a visit to the village on the Little Big Horn, and were not scouts as Custer believed them to be. Though the Indians had knowledge of the proximity of troops they did not at that time know even their approximate location. This, of course, has little bearing on the question under discussion and may be accepted for what it is believed to be worth.

The statement that "Benteen had shown Custer's message to Reno immediately upon joining him," which Lieutenant Solomon quotes from Colonel Graham's "Story of the Little Big Horn," has never to the writer's knowledge been confirmed by testimony or statements of the other officers present on that day; nor has such a definite statement appeared in the accounts of General Godfrey or other officers in their recital of events on June 25; nor was this point brought out in the Reno inquiry. Many references have been made to the discussion by the officers present, especially the junior officers, as to Reno's intentions during that long afternoon, but nothing beyond the above mentioned statement would indicate that Reno or Benteen intentionally abandoned the mission given Benteen by Custer's last written orders.

Lieutenant Solomon's conclusion, though he quotes Colonel Graham, does not differ materially from that set forth by the writer in his review of the campaign, nor does it introduce a new thought into a subject which has

[4] Italics are the author's.

been discussed for more than fifty years. It is essential to consult varied sources, preferably statements of fact that may be subjected to both external and internal criticism, in preparing a study or military campaigns or, I may add, in the criticism of such studies. Reliance should not be placed on one source or upon opinions formed from casual reading of promiscuous source data. Statements of fact, to be acceptable as such, must be supported, and the adage that "a little knowledge is dangerous" may well be kept in mind in either preparing or analyzing a review of a military campaign.

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Should We Defend The Constitution?

Col. Louis J. Van Schaick, Infantry

ROSIKA SCHWIMMER recently was denied citizenship by a decision of the United States Supreme Court, because she would not swear to defend the Constitution. Jane Garber, a young Mennonite nurse, has just been denied citizenship by the Common Pleas Court of Lima, Ohio, because she stated that to kill was unethical in her nursing profession, and that she would not kill even to save her mother. Professor Douglas C. MacIntosh of Yale was denied citizenship because he declined to commit himself in advance to bear arms in any and all wars. Now comes a decision of the State Department that Dorothy Detser, Executive Secretary of the International League for Peace and Freedom, can have a passport to go to the convention of her society, without swearing that she will defend the Constitution. She is allowed to affirm that she will support it. Public opinion will range from those who would nullify the Supreme Court decision, which is characterized as bad, to those who think it should go further than denying, and take away civil rights from those already citizens who have pledged themselves not to bear arms.

The question is bound to be complicated by the discussion of subsidiary issues. For example: Jane Garber is a Mennonite whose religious tenets teach that she must not kill. If we bar her have we not imposed a religious test forbidden by the Constitution? Dorothy Detser wants to go to a convention to discuss the enforcement of the Kellogg Treaties renouncing war. Shall the very State Department that originated the treaties prevent her going because she refuses to promise to go to war? Our country stands for a free press, free speech, and free thought. Should Rosika Schwimmer be denied citizenship when that denial forbids freedom of thought to one who is aspiring to citizenship? Professor MacIntosh, with a distinguished record behind him in the World War, refuses to say in advance that he will bear arms in another. If we make him swear to defend the Constitution in order to become a citizen, do we not deprive him of a freeman's right to determine for himself the merits of the

*Italics are the author's.

conflict in which he may be called upon to engage? The answer lies deeper than the resolution of any of these perplexing questions. It rests upon the solution of two fundamentals:

1. Are individual rights greater than collective rights?

2. How far may individual rights be abridged, that group society may be safeguarded?

The principle of the safety of the group at the expense of the individual is well established. It was recognized back in Bible times in the story of Jonah's being thrown into the sea that his companions might be spared. John Smith in Virginia laid down the rule that he who would not work should not eat. Napoleon abandoned his hospitals to save his army. Greely shot the starving soldier who ate more than his share. The non-vaccinated are forbidden to enter the schools. Lepers are segregated. The six-shooter in the West, with every man a law unto himself, has been turned over to the forces of law and order. A motor car moves along the city streets according to the red and green lights, rather than at the desire and convenience of the individual. Collective rights are greater than individual rights. The state, by renouncing war as a national policy, cannot shirk the responsibility of defending its people, its territory, and its policies. If aggression on the part of others makes means short of war inadequate to this end, then we must fight lest we become colonials going to war at the behest of the state that has taken us over without even as much to say about it as we have today.

Now let us look at the second question. How far may individual rights be abridged that group society may be safeguarded? The answer is, as far as may be necessary to safeguard the group, short of violating individual civil liberties guaranteed by the Constitution. Law, to be law, must be made, recognized, and enforced. It must be laid down by an authority capable of enforcing its will. Even Dorothy Detser is en route to an enforcement conference. When authority and enforcement fail, dictators loom. If the bulk of our people put the right of the individual above the right of the state, affirm that they will drink what and when they please, refuse to bear arms, and comply with law only when they find themselves in agreement therewith, we pass from constitutional to some other form of government.

The high conception of settling international disputes by means other than war, and the acceptance of the principle by the governments of the world, do not relieve a citizen as an individual of the responsibility to his government of bearing arms in her defense. Renouncing war as a national policy lessens the likelihood of his being called upon to bear arms, but the decision as to the necessity of his so doing still rests with the state—not with him.

It would be unwise to attempt to deprive those who have pledged themselves not to bear arms of their citizenship. We have recognized for a good many years the presence in the body politic of Quakers or Friends, useful citizens in time of peace, a problem to be treated with intelligence and moderation in time of war. Now there are added to that group many Christians of other denominations. When the time comes, most of the latter class will bear arms rather than see the land of

their birth go down before an armed foe. Saying they will not bear arms does not constitute the crime, but refusing to do so when called upon by the state does.

The safe policy for the United States to follow is to *deny* citizenship to those persons who place the rights of the individual above the rights of the state, to discourage the use of passports with a modified oath, and to continue to develop by education a love of country which will not stop short of any service that the nation may need.

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In The Good Old Days

CAPT. ELBRIDGE COLBY, 15th Infantry

I

DAY ROOMS THEN AND NOW

NOWADAYS the recreation room or "day room" is maintained by each company out of company funds, but it was not ever thus. Nowadays most of the merchandising in a garrison is through the commissary or the post exchange; but in the days of the "old army" before the Spanish War, the Secretary of War appointed civilian post traders, designating for each the post where he could operate. One of these post traders was "allowed the exclusive privilege of trade upon the military reserve" and was permitted to erect a building for housing his business. Rates and prices were determined by a military "Council of Administration" but this council was warned in a circular from the Headquarters of the Army, dated August 28, 1879, to consider "not only the prime cost, freight, and other charges, but also the fact that the trader has no lien on the soldier's pay and is without the security in this respect once enjoyed by the sutlers of the army."

In 1889, a post trader at Fort Snelling thought of turning his business over to another and his request for approval of the transfer drew from the commanding officer the following very interesting letter:

If Mr. John Frank is of unobjectionable character and of sufficient means, the council will agree to his appointment if he will, in writing, agree to the following conditions:

He is to erect a building in connection with the new post, when that post is occupied.

He is to provide a room for the use of the enlisted men with pool, billiard, and card tables and a bowling alley.

Also in connection with this a recreation room sufficiently large to accommodate the entire enlisted force at the post. The rooms to be built in a manner satisfactory to the Post Commander.

No, it is not only in these modern days of post war economy and getting back to normalcy, that the soldiers' minor purchases must provide the profits for fitting up a post. How many a post exchange or moving picture theater has furnished a recreation fund, built this dance hall or that grandstand? In the Old Army they were quite ready to ask the post trader

to build the recreation hall, using, of course, the profits out of sales to soldiers—not, by any chance, public funds.

II

HOME-MADE BEER TURNED THE TRICK

Up in the township of Charlotte, not one hundred feet from the shores of Lake Champlain, there stands a great boulder upon which the Vermont Society of the Sons of the American Revolution in 1913 affixed a bronze tablet bearing the following words:

NORTHWEST OF THIS SITE IN 1770
MOSES PIERSON
WHO OWNED THE SURROUNDING
THOUSAND ACRES BUILT
HIS HOME.

ON MARCH 12, 1778, IT WAS ATTACKED BY SIXTY BRITISH AND INDIANS BUT WAS DEFENDED BY THE PIERSONS, COLONEL THOMAS SAWYER, LIEUTENANT BARNABAS BARNUM, CORPORAL JOSEPH WILLIAMS AND FOURTEEN PRIVATES. LIEUTENANT BARNUM, THE BRITISH OFFICER, AN INDIAN CHIEF AND SEVERAL PRIVATES WERE KILLED AND A NUMBER OF PRISONERS WERE TAKEN.

THE HOUSE WAS SET ON FIRE BUT THE FLAMES WERE EXTINGUISHED WITH MRS. PIERSON'S HOME-MADE BEER.

There is history for you, and not a Mark Twain story of the escapades of Tom Sawyer; history written in enduring bronze. The lake was full to overflowing as a result of the spring freshets, but the home-made beer turned the trick.

I

An Anomaly of Rank

From the Notebook of "General Experience"

THE youngest of Napoleon's marshals was Auguste Frederic Louis Viesse de Marmont. Early in his career, in 1796, he was aide-de-camp to Napoleon. After the successful campaign against Wurmser, Napoleon sent Marmont to Paris with dispatches. As a reward, the Minister of War promoted Marmont to a colonelcy of horse artillery.

This brought on a curious state of affairs. Rank in the artillery was quite independent of rank in the army. Hence the following entries in the next army list:

"Bonaparte, Lieutenant-Colonel of Artillery, seconded as general-in-chief of the Army of Italy.

"Marmont, Colonel of Artillery, seconded as aide-de-camp to Lieutenant-Colonel Bonaparte."

The Infantry

REGULAR — NATIONAL GUARD — RESERVES

The Infantry in the Carnival

THE Annual Military Exposition and Carnival for the benefit of the Army Relief Society was held at the Army War College on October 3, 4, and 5.

Of the Doughboy's participation in this carnival the Infantry can well be proud. In the program of demonstrations the Doughboys furnished the bulk of the manpower for the spectacular climax, "Smashing through the Argonne with Sergeant York," and the 3d Battalion, 12th Infantry, from Fort Washington presented a fifteen-minute silent drill that was a perfect exposition of precision and training. The Infantry exhibit had been planned and arranged to appeal not only to the eye and ear of the visitor, but to his mind as well. There was on display a carefully arranged exhibit of Infantry weapons from the flintlock musket of the Revolution down through the weapons of the World War to include a test type of the latest automatic shoulder rifle. A complete brigade command post was installed and demonstrations of its proper operation were given. A sand table had been prepared, giving a reproduction of that part of the terrain in the Argonne in which Sergeant York glorified the American Doughboy, and there was an ever-attendant Infantryman ready to explain from this replica of the ground the details of Sergeant York's exploit. The tanks were on hand with a Mark VIII, a Renault, a T-1 E-1, a Ford, and a Christie; and that this exhibit appealed to visitors was evidenced by the long line of interested spectators waiting their turn to go through the huge Mark VIII.

To add life and interest to the exhibit, a demonstration area had been roped off. Here, from time to time, Doughboys explained the use of and demonstrated the different weapons, with special emphasis on methods of Infantry training in antiaircraft. Particular interest was gained in these antiaircraft demonstrations by the use of a full-sized antiaircraft swinging target. As a result of the demonstrations and explanations the visitor was able to understand why our present-day Doughboy regards antiaircraft firing, not as a defensive measure, but as true offensive action.

That part of the Infantry exhibit which probably awakened the most interest was the one that depicted by display captions and photographs the Story of the Infantry. A large central poster carried this legend:

"THE INFANTRY. THE ELEVEN-ARMED DOUGHBOY: RIFLE, BAYONET, PISTOL, HAND GRENADE, SMOKE CANDLE, RIFLE GRENADE, TANK, HOWITZER, MORTAR, AUTOMATIC RIFLE, MACHINE GUN, ALL ARE WEAPONS OF THE DOUGHBOY OF TODAY. FROM THE STONE AXE OF ANTIQUITY TO THE CALIBER .30 RIFLE

OF THE PRESENT, THE WEAPON IS IN ITSELF NOTHING. NEITHER ARMAMENTS NOR WEAPONS MAKE WAR, NEITHER BULLETS NOR BOMBS END WAR. THE POWER OF THE WEAPON IS THE MAN WHO USES IT IN BATTLE — THE INFANTRYMAN. AND THE POWER OF THE INFANTRY IS— MAN."

Accompanying this poster were three large photographs, "The Doughboy," showing the Infantry weapons; an American division on the march in France, and the triumphal march down Fifth Avenue of the 1st Division—manpower made manifest.

Flanking this exhibit on one side were selected photographs of types of Doughboys of the World War, each with the War Department citation appended, so that the visitor might read of the deeds of valor and heroism unembellished by the pen of fiction writers, but in the plain precise language of War Department orders. Opposite these World War Doughboys were photographs of types of Doughboys of 1929 showing representative soldiers from our Infantry regiments who are ready in an emergency to perform just such acts of heroism and devotion to country as did their contemporaries of 1918.

Errata

IN the September number of the JOURNAL a photograph was erroneously captioned the combat squad from the 15th Infantry, instead of from the 35th Infantry as it should have been. We therefore reproduce the photograph herewith with its proper title.

On page 320 of the September JOURNAL, in reporting on the 29th Infantry's bayonet season, there is a statement that one thousand and fifty-five men were required to run the course. This should read one thousand one hundred and fifty-five men.

The Chief of Infantry's Combat Squad

Corp. Louis Walerwicz's Squad, Co. E, 35th Infantry

Ⓘ

Regular Infantry

THE 4th Infantry, Col. J. K. Partello commanding, is proud of the shooting ability of its members. At camp Perry four men from the regiment were on the Infantry squad. Sgt. John Carlsen and Corp. M. L. Moore were on the Infantry's first team and Lieut. Kameil Maertens and Sgt. E. Backell were on the second team. These officers and men have received letters of commendation from the Chief of Infantry for their splendid work.

When the traffic policemen of the city of Spokane, Washington, recently appeared in blue uniforms which closely resembled those of Army officers, Colonel Partello took up the matter with the Spokane Chamber of Commerce. As a result the uniforms were altered by the addition of colored tabs on lapels and cap visors. These tabs made a sufficient change to prevent violation of the Federal statute about uniforms.

Inspection reports frequently note that one of the principal criticisms of company messes is that the food is not served hot. Lieut. Col. E. M. Wilson reports from the 8th Infantry that Capt. C. G. Hammond of that regiment has devised a food and dish warmer which is giving excellent results. The members of Company I now are served warm food on warmed china.

The warmer is an adaptation of the commercial steam table. It uses hot water for heating.

The cuts of the warmer take up too much space to reproduce here. However, the following by Captain Hammond fully describes the devise:

FOOD AND DISH HEATER

Construction:

1. The following will give a description of the table:

(a) A heavy frame of 1-inch angle iron of these dimensions was constructed—68 inches long by 40 inches in width by 27 inches in height. This frame was covered with 1-inch by 2-inch wooden boards with 1-inch between boards and with molding around edges to make it tight. A shelf 8 inches from floor was put in under the top. The entire frame work was enclosed with galvanized sheet metal with one side divided into small doors. The shelf was covered with sheet metal also. This space is where dishes are kept.

(b) A tank made of galvanized sheet metal was constructed. It is of the following dimensions—72 inches by 40 inches by 8 inches depth. This was made watertight. An inlet hole was left or cut through one end of the box and tank about three inches from the top, also an outlet was cut near the opposite end and in the bottom of the tank. A drain for cleaning out tank and an overflow was installed. (See diagram.) The water line was brought to the side of the tank with spigot attached so that tank could be filled when desired. It was found better to make all inlet, outlet, etc., pipe connections to tank by threading the pipe long enough to screw on a washer then pass through hole in galvanized tank and then screw on a nut rather than soldering it on.

(c) A small laundry heater was secured and this was connected to the tank in the following manner: The top opening was connected to the inlet pipe. The lower was connected with the outlet opening. The open tank was then filled about two-thirds full of water. This filled the water jacket around the fire box of the stove.

Method of Operating:

(a) Fire is built in the stove and as the water heats it flow from the top pipe into the tank—cold water returns through the lower pipe into the water jacket. This continues until the water is hot and will boil if the fire is kept going; steam being generated will still flow through the top pipe. It was found that the water was hot enough for use in one hour after the fire was started in the stove.

(b) The return pipe is placed along the bottom of lower compartment in at least three coils. This furnishes some heat for the dish compartment. The tank is resting on the slatted wood top and heat is given off into the lower compartment. It has been found that if the dishes are placed in this compartment as soon as they are washed that by the time they are needed for another meal they are warm.

(c) Angle iron frames were built which would hold the bake pans and boilers, size issued by the Q. M. and placed in the tank. The food is brought from the stove in the same vessels in which it was cooked and placed in the racks. The water is at such a temperature that the food is kept hot. Covers were made of sheet metal to cover the frames mentioned above in this paragraph. They are used for two purposes—cover tank and aid in getting and keeping water hot, then to cover vessels of food when not being served from to keep food warm.

General:

As much sheet metal as possible was used to try to keep all heat in by making tight compartments, also it is easy to keep clean and make a presentable appearance. The size of the tank was decided upon with the idea in view of serving from three large size bake pans and three issue boilers at the same time.

2. *Suggestions for Improvement of This Type of Heater:*

1. Reduce size of tank so as to permit no waste space. It is believed that room for three bake pans and three boilers is sufficient.

2. Have return pipe, one going back to stove, passed along the bottom of

the lower compartment at least three times. This will give more radiating surface and will heat this better.

3. Use as little wood in the construction as possible.

4. Have doors into lower compartment slide.

5. Paint with heavy paint, giving special attention to all joints also as to make them tight as possible.

6. Make or purchase covers for tank of some good metal, Monel, if possible.

①

The Chief of Infantry has received the following message from the Commanding General, Philippine Department:

The annual rifle and pistol matches between the 15th Infantry and United States Marines detachment, American Legation, Peking, China, were fired on September 17 and 18 at the national rifle range at Peking. The Marine team was victorious in the rifle match, making a score of 5,223 against 5,148 made by 15th Infantry. The 15th Infantry team won the pistol matches with a score of 2,409 against 2,342 made by the Marine pistol team. The firing by members of both teams was of a high order and indicated careful and intelligent training and coaching.

A message from the commander of our troops in China reads in part as follows:

Target practice of 15th Infantry completed. Results excellent and show vast improvement of preceding years. Interest of officers and men in range work high and energy displayed most commendable. Six hundred and twenty-five, or over ninety-nine per cent, fired rifle with qualifications as follows: experts, 144; sharpshooters, 225, and marksmen, 250. Per cent qualified with rifle, 99.04; with average score per man of 290.835. Both machine gun companies qualified one hundred per cent with average score per man 344.778 * * *. Chief of Infantry's combat squad problem was won by squad from Company G with remarkable score of 3,102 * * *.

①

The 21st Infantry, Col. G. D. Arrowsmith commanding, reports completion of a very successful machine gun marksmanship season. Of the twenty-five firing days only one was lost on account of bad weather. The regiment qualified one hundred per cent. One hundred and eighty-two men fired. With an average score of 330.71, they led the Infantry regiments at Schofield Barracks.

The new known-distance machine gun range built at Schofield Barracks during the past year is one of the best in the Army. There are six firing points and the targets and pits are so arranged that the targets can be drawn under cover for marking.

The 21st Infantry has been experimenting with an antiaircraft mount for machine guns. The photographs on these pages show the results. The tests have included use of the mount on all marches and field problems in the past few months. Its particular advantages are that the mule is away from the cart when the gun is fired and that the gun can be put into action against either ground or air targets very rapidly. Since scraps of lumber and metal fixtures from dismantled ammunition carts were used in building the cart, the cost of materials was nothing.

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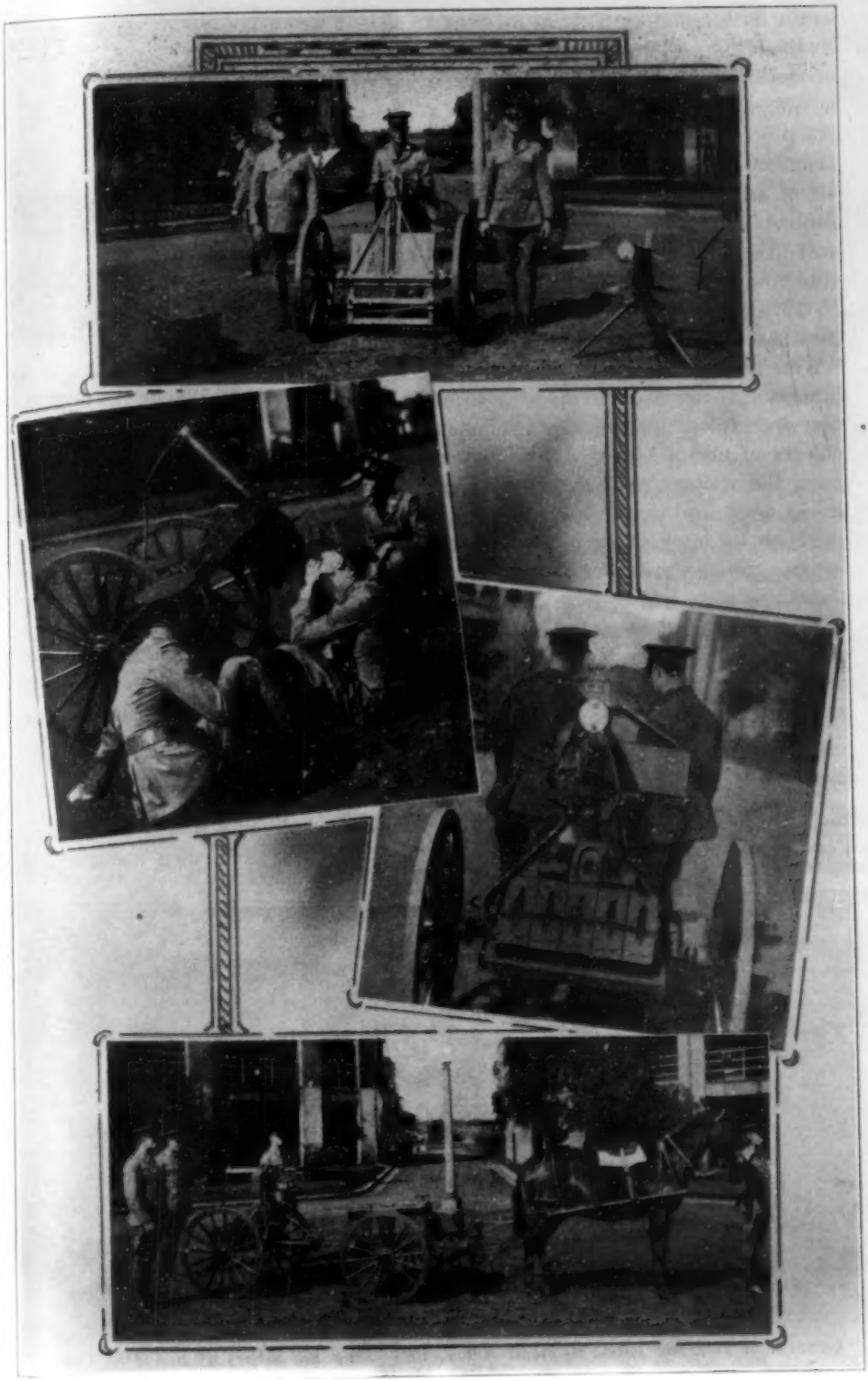
On August 14, Camp Stephen D. Little was the scene of a somewhat unusual tour of inspection. General of Brigade Juan Felipe Rico, commanding the garrison at Nogales, Mexico, accompanied by a staff of eight officers, paid a return inspection visit



to the 25th Infantry, Col. A. M. Shipp commanding. After receiving a salute of eleven guns General Rico inspected a company of the 25th Infantry, a troop of the 10th Cavalry, and the members of the 25th Infantry band, all of which constituted his escort of honor. The party then watched demonstration drills by the C. M. T. C. students, the 25th Infantry, and Troop F, 10th Cavalry. After that came a showing of the War Department film "West Point" and a luncheon. At the luncheon General Rico made a brief and graceful address to the assembled officers of Camp Little. In the afternoon the visitors were shown a swimming meet and small bore firing on the 25th Infantry's new indoor gallery range. As the visit drew to its close there was a general feeling that it had further improved the already cordial relations between the Mexican and our own military forces stationed at Arizona and Sonora.

①

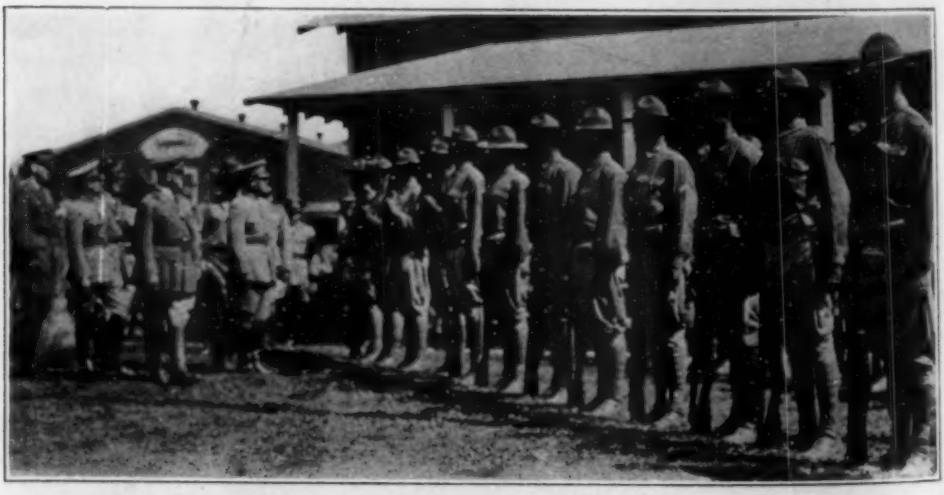
The experiments with reorganizing units in the 29th Infantry, Col. Harris Pendleton, Jr., commanding, have

Kolchak, a pedigreed wolfhound and the mascot of the "Wolfhound" Regiment, the 27th Infantry

brought to light some interesting questions. One of them is: Where shall we put the caliber .50 machine guns in the organization scheme?

It is interesting to note the equipment needed for a platoon of caliber .50's. One truck is used exclusively for carrying gun and tripod. The tripod is bolted to the floor and carries an adapter for antiaircraft firing. The ammunition is carried in the second truck. Eight men are needed for each gun.

The pistol team of the 30th Infantry, Col. F. R. Brown commanding,



General of Brigade Rico, Mexican Army, inspecting his escort of honor at Camp Stephen D. Little, August 14, 1929

took first honors in the fourth annual competition for the McQuaide trophy at Camp McQuaide, Capitola, California, on September 16, with a score of 4,319 out of 5,000. This match is an invitational affair and is a feature of the 63d Coast Artillery (A.A.) regimental day program. The course is for ten-men teams and consists of: slow fire—ten shots at fifty yards and ten shots at twenty-five yards; timed fire—ten shots at twenty-five yards; rapid fire—ten shots at twenty-five and ten shots at fifteen yards.

Ⓘ

Company "H," 30th Infantry, is proud of its harness and saddle room, believing it to be one of the best in the service.

The old rough interior was sheathed, then painted and enameled white. The mule harness is hung on two-and-a-half-inch pipe pins, painted black, with Infantry blue caps. The saddles are on similar pipe pins and each set of harness and saddle has the name or number of the animal and its place in the organization neatly printed on a card set above the pin in a suitable bronze holder. The riding bridles are hung on shaped blocks with name plates above. All bridle brow bands are enameled white and Infantry blue.

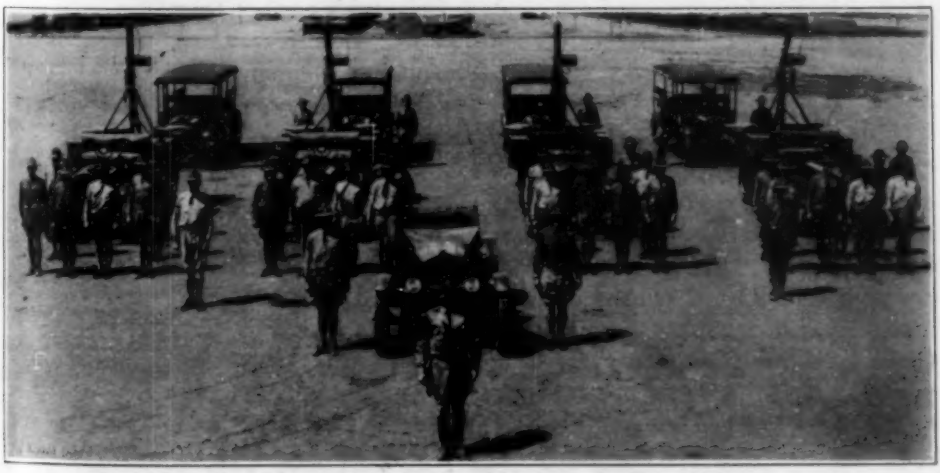
The concrete floor has been treated with a terra cotta colored concrete paint, and the lights are well set against the ceiling, controlled by a lever switch at the side of the door.

All the work, except the electrical installations, was planned and executed by the company supply sergeant, Edward E. Tabor, and the stable sergeant, Pellegrino Penza, with some assistance from the company mechanic and fatigue details.

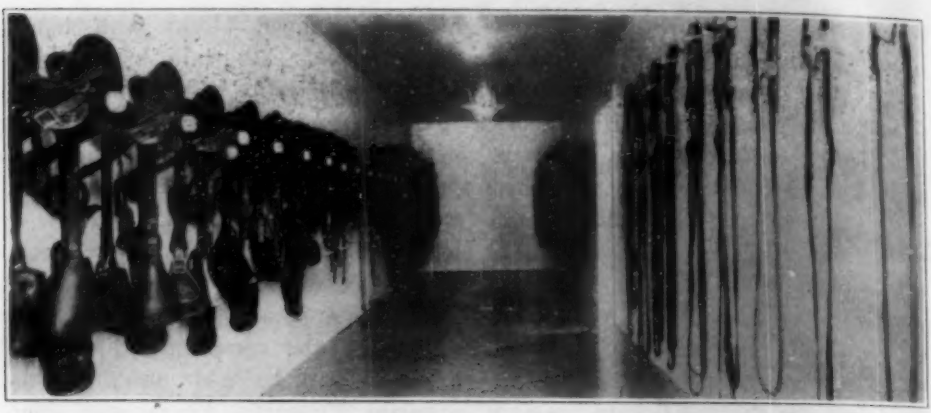
Ⓘ

In the Hawaiian Department all men of rifle and headquarters companies are required to know how to fire machine guns. Each rifle company has eight machine guns that are used principally for training in repelling landings on the shores and in antiaircraft firing.

For the 35th Infantry, Col. I. C. Welborn commanding, special machine gun firing for all troops took place during September. First, forty men from each rifle company and twenty from headquarters company fired seven hundred rounds each on the one thousand-



Experimental Caliber .50 Machine Gun Platoon, Company H, 29th Infantry



A part of the Saddle and Harness Room of Company H, 30th Infantry

inch range. After that comes beach firing for training in repelling landings on the shores. The forty men per rifle company who completed the one thousand-inch firing get the training in beach firing. Machine gun anti-aircraft firing is also done on the beach. Each man has seventy-five rounds with which to hit two balloons, and seventy-five rounds for firing at sleeve targets. This ammunition includes tracer ammunition in the ratio of one to five. Twenty-five especially selected men from each rifle company and forty-eight from each machine gun company fire at the aerial targets. The machine gun companies furnish selected men to act as assistant instructors for the rifle companies.

At Fort Douglas, the 38th Infantry, Col. H. C. Price commanding, has recently completed a very successful season in rifle marksmanship. It qualified 96.97 per cent with an average score per man of 282.10, a marked improvement over last year. Company E, Capt. G. S. Pierce, was the high company; it qualified one hundred per cent with an average score of 294.18.

In machine gun marksmanship the percentage that qualified was 98.98 with an average score per man of 330.53. Company H, Capt. A. L. Morris, was high company with one hundred per cent qualified and an average score of 342.05.

The Howitzer Platoon, Headquarters Company, Capt. W. I. Sherwood, qualified one hundred per cent with ten expert gunners, four first class gunners and four second class gunners.

The Chief of Infantry has sent congratulatory letters to the respective regimental commanders for the following winners of places on the Chief of Infantry's combat team:

1st Infantry, Corp. Mayo Seitz' squad of Company K.

9th Infantry, Corp. E. L. Sanders' squad of Company F.

16th Infantry, Corp. J. E. Sandlin's squad of Company A.

20th Infantry, Corp. Bill O. J. Voges' squad of Company F.

45th Infantry, Corp. Pedro Recario's squad of Company K.

57th Infantry, Corp. Francisco Alfar's squad of Company I.

65th Infantry, Corp. Feliciano Gutierrez' squad of Company C.

Reserve

Theory vs. Practice

Lieut. Dewey A. Herrin, 322d Infantry (Reserve)

THE two hundred and forty-three Reserve officers attending the summer training camp at Fort Bragg, July 14 to 27, had the unusual experience of working in the field for twenty-four hours as a division. This taught them more of their duties than two dozen lectures would have done.

Assisted by officers of the 8th Infantry from Fort Moultrie and officers and enlisted personnel of Fort Bragg, the plans developed in stages from preliminary demonstrations of platoons in attack with machine gun and howitzer support into a corps action with the 81st Division, complete, as the assault unit.

The problem reached its climax the afternoon following the night maneuver. It brought to light several discrepancies that doubtless would exist under actual war conditions. The first and most important of these was the failure of liaison between artillery and Infantry units. The Infantry, trying to obtain artillery fire, was unable in some instances to locate the supporting artillery batteries. It was found later that one artillery officer had been at a regimental command post and no one knew (or apparently thought to ask) who or what he was. Evidently, he felt his services not needed, and accordingly returned to his billet.

The next trouble came shortly after the attack started. The message center at one regimental command post was flooded with messages of all descriptions, many of them verbose, some of them improperly authenticated, others not addressed. It was necessary to use the phone very frequently because of the impossibility of keeping enough runners at the Message Center to distribute messages as fast as they came through. Outgoing messages were frequently received at the regimental message center that had not been recorded at the battalion message center; the adjutant of that battalion naturally had a hard time trying to keep the unit journal correctly.

Officers should know what to say and how to say it briefly.

Many of us wondered whether so many records of messages would not be detrimental under war conditions instead of beneficial. They doubtless would unless officers were better trained in preparing and forwarding of messages than many of them are apparently at this time.

Another important thing that was brought out is the necessity of carefully considering the rate of advance of troops in attack in order to prepare artillery firing instructions. Unless this rate is approximately correct, the artillery fire instead of being a help, may well become destructive.

Since this is the age of specialists, why do we not have our Reserve officers, especially staff, assigned permanently in their regiments or brigades? If an officer knows before he goes to camp what his assignment will be, the chances are that he will study his duties before he leaves home and be ready for his work when he reaches camp. Considering the fact that it takes years to make officers at West Point, we can hardly expect our Reserve officers to perform miracles with only two weeks' training a year, but

it is the opinion of many Reserve officers that if they had a definite assignment of duties it would help them in preparing for their summer training before leaving for camp.

The entire enlisted and official personnel of Fort Bragg, and the officers and personnel of the 8th Infantry, attached for the purpose of training the 81st Division, are to be congratulated upon their thorough cooperation and the efficient instruction furnished during the training of the division this summer at Fort Bragg.

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COLONEL COLE BOOSTS RIFLE SHOOTING

Rifle shooting, and incidentally, National Preparedness, recently received a big boost when Col. Walter C. Cole, president of the Reserve Officers Association, pledged his and the Association's cooperation with the American Legion's program to establish some ten thousand junior rifle clubs under the auspices of that number of American Legion posts throughout the country.

Colonel Cole, who is a nationally recognized spokesman in matters pertaining to national preparedness, says:

Every American citizen enjoys the privileges of the liberty of America, and he should be prepared to defend them in the event any one makes aggression against them.

Rifle shooting is the best means of preparedness against any emergency and, in addition, is one of the cleanest sports.

May we never have to turn our sights against anything but the targets on the rifle ranges, but if we must, may we be prepared to give the best possible account of ourselves through the peep sight.

The establishment of the Junior Rifle Clubs by the ten thousand American Legion posts, in my opinion, will be one of the outstanding activities of that organization, an activity that I wholeheartedly endorse, and to which I pledge my support and that of the organization of which I have the honor to be president. We shall work out a program of cooperation and I shall place the facilities of our organization at the command of the American Legion to assist in any way we may.

We hope to make available a rifle range to every American citizen and afford him the best opportunities to perfect himself in rifle shooting.

Colonel Cole is also advocating increased participation in rifle and pistol shooting by Reserve officers, and is personally giving several trophies and medals which will be awarded to reserve teams and individual Reserve officers participating in National Matches.

①

The 406th Infantry, Col. Leroy K. Robbins commanding, one of the units of the 102d Division, Organized Reserves, completed a seventeen-day tour of duty with the C. M. T. C. on August 30, 1929, at Fort Leavenworth, Kansas. Col. E. L. Butts, chief of staff of the 102d Division and assistant camp commander, told the regiment that its work had been highly satisfactory.

The C. M. T. camp at Fort Leavenworth was intended and equipped for sixteen hundred boys, but actually had twenty-four hundred. The companies each averaged three hundred boys, organized into four platoons. As many of the platoon commanders were R. O. T. C. graduates without war experience, they had a severe test of their ability to handle green troops such as they would command in an emergency.

One of the novelties of this camp was that the assistant camp com-

mander, Col. E. L. Butts, Infantry, is the author of Butts' Manual, and one period each day was given over to this physical drill with rifles under his personal supervision.

Another and very helpful novelty was the use of a portable loud speaker at mass drills, exercises, and lectures.

On account of the number of boys sent to this camp, it is hoped that next year the organization may be two regiments of eight companies, one hundred and fifty men per company, divided into three platoons. This would make the instruction more efficient, and would enable the camp to be organized as a brigade, with two regiments of this Organized Reserve division operating during the first two weeks of the camp, and the other two regiments during the last two weeks. Each Infantry regiment of the division would have active service each year and the officers of these Reserve regiments keep themselves more nearly ready for active service.

General Washington's Views on Pay

From the Notebook of "General Experience"

APROPOS of the present widespread interest in a revision of the pay schedule, it is of interest to note that Washington was a strong advocate of adequate pay. In a long letter to the President of Congress, written on September 24, 1776, he urges that officers be allowed sufficient pay "to live like and support the character of gentlemen."

This letter further points out the evils of officers being driven to various expedients to augment their pay, and states the principle: "There is nothing that gives a man consequence and renders him fit for command like a support that renders him independent of everybody but the State he serves."

Books

IT MIGHT HAVE BEEN LOST, by Thomas Clement Lonergan, formerly Lieutenant Colonel, General Staff, A. E. F., 327 + XIV pages. G. P. Putnam's Sons, New York, 1929. $3.50.

Many books have appeared on the World War and there will be many more in the future. A few attain the level of literature. It Might Have Been Lost is one of the few. In addition, it is a valuable contribution to the history of America's effort and deserves a wide reception.

The author, as a staff officer in the A. E. F. during the formation and fighting of the American First Army and later as the representative of the Historical Section in London, had opportunities to study at first hand the complex and delicate problems involved in the formation and continued existence of the First Army. He has admirably presented this great accomplishment of General Pershing in a pleasing and fluid style with proper historical mention and reproduction of official documents. He has shown the desire of the British to incorporate American battalions in the needy ranks of the British Expeditionary Force, the keen endeavors of the British general, Wagstaff, to further this desire, and the reliance the British placed in the difference in language to wean us away from the French. He shows also that the French made similar, if less keen, endeavors to use American units as replacements. Finally the author crowns General Pershing's fixity of purpose with achievement and consummation—the reduction of the St. Mihiel salient—by the newly-born American Army.

The public can now procure from the Government Printing Office the War Department account of this critical period in American history—"The Genesis of the American First Army." It is a stirring tale to tell with pride that a virile American commander in a distant theatre of operations held unswervingly to a correct purpose, maintained an American independence of spirit, organization and accomplishment in the face of the greatest difficulties and thus brought about an early Allied victory. The American people of today and the generations yet unborn—if they are to run true to form—are entitled to know the facts. It is well that this book has appeared for the sake of truth, else "It Might Have Been Lost."

SINISTER SHADOWS, by Edwin Marshall Hadley. The Tower Press, Inc., Chicago, 1929; 385 pages. $2.50.

Colonel Hadley, of the Military Intelligence Reserve, exposes the sinister influences of those persons of whom Prof. Lothrop Stoddard writes ". . . the high-grade defectives, the near genuines with the fatal taint which perverts their talents. The levelling social revolutionary doctrines of our

day, like Syndicalism, Anarchism, and Bolshevism, superficially alluring yet basically false and destructive, are essentially the product of unsound thinking—by unsound brains."

With radicalism rampant throughout our land, with the self-styled intelligentsia sneering at patriotism, with subversive influences undermining the fabric of our strength, with subtile forces poisoning the minds of our school children and college students, with aliens seeking to impose upon us their weird theories of life, with clergymen prostituting their cloth for power and gold—it is high time for us to pause and see whither this nation is headed.

Colonel Hadley in his interesting and informative book points the way to security and peace. The book should be in every home.

This reviewer places a copy in the hands of his sixteen-year-old son with full confidence that a better American will be made thereby.

A History of the American Nation, by Willis Mason West, sometime Professor of History at the University of Minnesota. The Ronald Press Company, New York, 1929; 923 pages. $6.00.

Professor West has written a vivid picture of the growth of our nation from a few isolated settlements to one strongly welded nation. He discusses in detail the causes of our various wars and their effects, but dismisses the active operations which brought about a restoration of peace with but little more than his frank, "The plan of this volume forbids any narration of campaigns—or even the most tempting instances of individual heroism." (Page 240.)

Although he neglects the tremendously important part that the Army played in the growth of our nation—its peace time work as well as its restoration of peace after our diplomats had lost it—his History of the American Nation is a distinctly valuable addition to the stories of our country.

Luck, by Lothrop Stoddard. Horace Liveright, New York, 1929; 320 pages. $2.50.

The book Luck deals with the element of chance in the lives of all of us. The author has secured the personal views of several hundred men and women whose names appear in print more or less frequently. They range from H. L. Mencken of the American Mercury [Bichloride of] and Texas Guinan up to Admiral Fiske and Senator Wheeler.

The titles of a few chapters will give the scope of this absorbing book. The Lottery of Life, Luck and Science, Luck and Gambling, Luck in Sport, Ifs of History, Luck in Business, Lucky Stars, and Ifs of Politics. Two hundred and fifty anecdotes about the luck of Calvin Coolidge, John Jacob Astor, Charles M. Schwab and others, gleaned from interviews, articles, news items, and the like, afford many hours of instructive and interesting reading. The author tells how a pinch in the leg put Theodore Roosevelt in the White House, and how a tummy-ache is responsible for the present République Française.

Luck is enjoying a bit of deserved luck in that it has had two printings in its first month.

JEFFERSON DAVIS: His Rise and Fall, by Allen Tate. Minton, Balch & Co., New York; 311 pages. $3.50.

The author of a life of Stonewall Jackson has given us a searching biography of "one of the great and admirable failures of history." Mr. Tate stresses the point—"He could not manage men, and he was too great a character to let men manage him; that is the tragedy of his career."

Jefferson Davis' contempt for the crowd, his loyalty to his friends, his dislike of criticism, his affliction with dyspepsia, and his confidence in his own opinion are all shown as having combined to bring about his fall. Mr. Tate paints Davis to be much like Woodrow Wilson in many aspects of his character.

Of interest to the military student is the discussion of the major strategical angles of the Civil War. The author points out several instances in which, in his opinion, the Confederacy had victory within reach, but, through inexcusable delays or failure to estimate the situation, failed to rise to the occasion.

This fine study of the administration of the Confederacy, though it places Emory R. Buckner [sic] in command of Fort Henry, is a splendid contribution to the history of the Civil War.

WINGS ON MY FEET: Black Ulysses at the Wars, by Howard Odum. The Bobbs-Merrill Company, Indianapolis; 309 pages. $2.50.

In spite of many laudatory reviews and the understanding that Mr. Odum is a white man, Wings On My Feet appears, to this reviewer, as if it had been written by a New England negro trying to record the views of a southern darky in cornfield dialect.

Though fond of negro stories and guilty of having written one which enjoyed publication, Wings On My Feet left this reviewer stone cold.

Training with a Purpose

From the Notebook of "General Experience"

THERE should be a definite purpose to every bit of training scheduled. Merely filling the allotted time with some subject is not achieving progress. In planning any training, these questions should be answered: What is the purpose of this period? Why this subject? What is to be accomplished?

Routine repetition of any kind of exercises is often of doubtful value. It resembles the action of the African natives, who ate a book of Livingston's in order to procure the satisfaction he received from it.

The Infantry Association

Annual Meeting

The Annual Meeting of the United States Infantry Association will be held in the Infantry Building at 4:30 p. m., December 20, 1929. The election of officers and members of the Executive Council will take place at this meeting.

Election of Officers

Please indicate your vote on this ballot and send it to the Secretary, U. S. Infantry Association, 1115 17th St., N. W., Washington D. C., so as to reach him not later than December 15, 1929.

Vote for: one for president, one for vice president, seven for additional members of the Executive Council. Do not vote for same person for two offices.

Ballot

My vote for officers and for members of the Executive Council, U. S. Infantry Association, is as follows (put check mark before name):

For President

.....Col. C. C. Allen
.....Col. F. W. Bugbee
.....Col. J. L. DeWitt
.....Lieut. Col. C. B. Hodges
.....Brig. Gen. G. S. Simonds

For Vice President

.....Lieut. Col. J. R. Brewer
.....Maj. S. B. Buckner, Jr.
.....Col. F. W. Bugbee
.....Col. R. J. Burt
.....Lieut. Col. E. Butcher
.....Col. J. L. DeWitt
.....Col. L. D. Gasser
.....Lieut. Col. C. B. Hodges
.....Capt. P. E. Leiber
.....Col. J. F. Preston
.....Brig. Gen. G. S. Simonds
.....Maj. W. H. Simpson
.....Col. D. L. Stone
.....Col. W. W. Taylor
.....Lieut. Col. C. H. Wright

NOTE: The present ballot does not carry the name of Maj. Gen. S. O. Fuqua as a candidate for any office. This action, concurred in by the Chief of Infantry, is based on the belief that the Chief of Infantry can best serve the Infantry by not being directly connected with the governing body of the Association, thus giving him a freer hand in the administration of his office and in the various activities of our arm.

Any officer who has already voted for General Fuqua for some office and who cares to change that vote to some other officer will please send a brief informal notice of his new vote to the Secretary.

(OVER)

CUT OR TEAR HERE

For Additional Members of the Executive Council

.....Col. C. C. Allen
.....2d Lieut. T. H. Allen
.....Maj. G. P. Baldwin
.....Capt. P. G. Balcar
.....Maj. L. J. I. Barrett
.....Maj. J. C. P. Bartholf
.....Lieut. Col. J. R. Brewer
.....Maj. S. A. Brown
.....Maj. S. B. Buckner, Jr.
.....Col. F. W. Bugbee
.....Col. R. J. Burt
.....Lieut. Col. E. Butcher
.....Capt. G. B. Campbell
.....Maj. T. B. Catron
.....Lieut. Col. A. D. Chaffin
.....Capt. W. J. Clear
.....Maj. R. C. Cotton
.....Col. E. Croft
.....Maj. E. P. Denson
.....Col. J. L. DeWitt
.....Maj. D. D. Eisenhower
.....Lieut. Col. C. B. Elliott
.....Maj. E. W. Fales
.....Maj. E. L. Field
.....Lieut. Col. W. S. Fulton
.....Col. L. D. Gasser
.....Capt. R. B. Gayle
.....Lieut. Col. H. S. Grier
.....Maj. W. H. Haislip
.....Capt. F. B. Hayne
.....Maj. L. S. Hobbs
.....Maj. W. H. Hobson
.....Lieut. Col. C. B. Hodges
.....Col. C. F. Humphrey, Jr.
.....1st Lieut. H. J. Hunt, Jr.
.....Col. M. S. Jarvis
.....Maj. A. S. Kuegle
.....Maj. J. W. Lang
.....Capt. W. G. Layman
.....Maj. B. R. Legge
.....Capt. P. E. Leiber
.....Capt. A. Lopez
.....Maj. B. Magruder
.....Maj. F. C. Mahin
.....Col. C. H. Miller
.....Maj. M. C. Mitchell
.....Lieut. Col. C. B. Moore
.....Lieut. Col. E. J. Moran
.....Maj. J. D. Patch
.....Lieut. Col. S. L. Pike
.....Col. J. F. Preston
.....Maj. P. L. Ranson
.....Maj. E. F. Rice
.....Brig. Gen. G. S. Simonds
.....Maj. W. H. Simpson
.....Lieut. Col. M. E. Spalding
.....Col. D. L. Stone
.....Col. W. W. Taylor
.....Maj. H. Terrell, Jr.
.....Capt. H. A. Tonneson
.....Col. L. J. Van Schaick
.....Lieut. Col. C. H. Wright
.....Capt. D. P. Yeuell

(*Signature*)